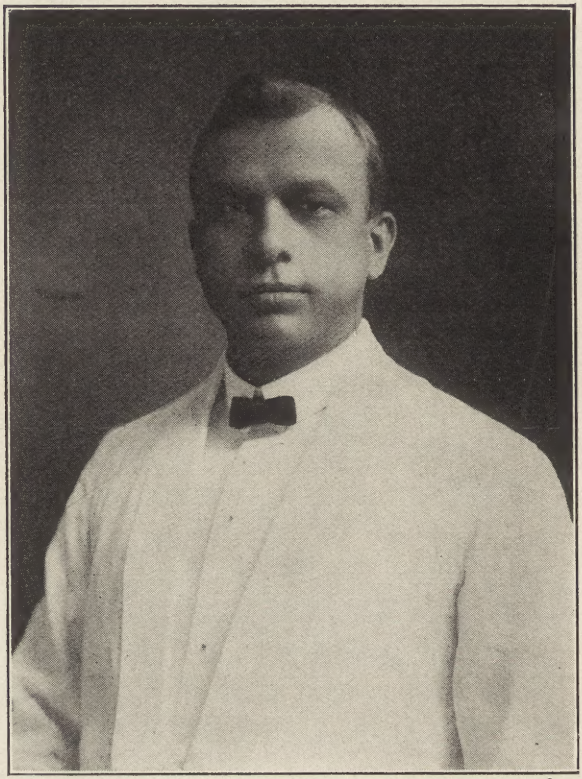
Blank, Edition and Job Forwarding

Finishing and Stamping

By JOHN J. PLEGER

BOOKBINDING



JOHN J. PLEGER.

BOOKBINDING

AND

ITS AUXILIARY BRANCHES

(IN FOUR PARTS)

BY

JOHN J. PLEGER

PART THREE

BLANK, EDITION AND JOB FORWARDING, FINISHING AND STAMPING

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FOREWORD

It is not laudation of any trade to say that it follows in a beaten path when there is no reason therefor except that methods of procedure are habitual. That the present-day craftsman leaves too much to precedent and habit, and does not exercise enough his power of initiative, is demonstrated clearly by experience in bookbinding. To improve ought to be the constant aim; to do this, the continuation of steadfast methods and styles must be merited by sufficient reasons.

The invention of machinery has given impetus to all branches of manufacturing, and, by the displacement of hand labor, has given a possibility for further development of modern methods, yet we find there is in many binderies labor performed by hand which, with a proper understanding of hand and machine methods, might be done more expeditiously and perfectly with machines. Modern conditions and demands, however, are not an unmitigated advance; coupled with the opportunity for improved methods have come the pressure of competition and the slipshod makeshifts to economize in material and time without regard to the fineness or durability of the product, which puts on the appearance of a genuine article and is a good seller because of the cheapness in price. "Art with cheapness" was the motto of the ancient Greek, and it would be well for the modern man also to adopt the slogan. Cheapness, in contrast to extravagance, is meant, not to be confused with shoddiness. The Greek believed, as we should, that simplicity and plain durabilty were the methods of attainment. Art in bookbinding should never be overlooked, for art means wholesomeness, and wholesomeness is lost by resorting to shabby, albeit gaudy, styles and materials, but is

gained by better and quicker methods of execution and suitability of design to the theme.

So, changes in, as well as continuation of, methods and styles of bookbinding must be merited by sufficient reasons. The terms of bookbinding are sometimes technical, but at other times are local or accidental. To have terms of value it is necessary to make them universal, so that a science may be based upon them, and one man may profit by the experience of another. It may seem strange, yet it nevertheless is true, that terms are at variance in different localities, and there seems to be no harmonious plan of description.

A demand has arisen for a book for use as a text. The growing generation is composed of students, and there is a demand not only for advanced knowledge among those practicing the art, but among many would-be learners for a school, and, more essential still, a text. Craft education is of importance in these days of appreciated handiwork; moreover, among those whose livelihood is earned by such labor, competition is so keen that each laborer must needs strive to perfect himself in order to obtain the rewards of success.

It has been my aim in compiling these pages to treat the subject in a concise and comprehensive manner, defining consistently terms and processes in a way which may be grasped by novices and serve as an aid to bookbinders, librarians, and printers who are more or less in charge of office work. To instruct the printer and binder, serve as a court of appeal for the man in the bindery when he should question erroneous work orders, and to aid both in satisfying the requisitioner, these pages are written. The wail for " the prostitution and the decadence of the once proud art of bookbinding " should be quelled by the improvements of to-day succeeded by those of to-morrow in the advance of a " modern bookbinding."

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LIST OF ILLUSTRATIONS

BINDING DEFINITIONS

PROCESS TERMS.

ALL-ALONG.— In sewing a book, when the thread is passed from kettle-stitch to kettle-stitch, or from end to end in each section, it is said to be sewed all-along.

AROUND THE BAND.— The term applied to the carrying of thread around the band space in the fold of the section.

BACKING.— The process of spreading the signatures to form the ridges on the sides of the book in preparing for the cover or case. It is done by hand with a hammer; or by a roller backer; or rounding and backing is done with one operation on a machine.

BLEEDING.— Trimming margins of books or printed sheets into the printing.

BULKY.—A book is said to be bulky when too thick a thread has been used in sewing.

BUNDLING.— The process of ejecting air by pressing and tying together folded signatures for the purpose of making them solid.

BURNISHING.— Polishing edges with an agate or bloodstone after they have been colored, gilt-edged, or marbled.

CANCELING.— Cutting out and replacing with corrected pages printed leaves containing errors.

CAPS.— Paper coverings used to protect the edges while a book is being covered and finished.

CASE-MAKING.— Making covers which are made off the book.

CASE.—A cover which is made off the book.

CASING-IN.— Pasting the end-leaves and inserting books in the covers.

CHASING EDGES.— (See Goffering Edges.)

COLLATING.— Examining the signatures after a book is gathered to see that they are arranged in consecutive order.

CREASING.— Bending sheets with a folder.

CRIMPING.— Creasing, bending or mangling sheets from both sides by means of wheels on a machine to permit a flat lay in loose-leaf covers.

CROPPING.— Trimming a book disproportionately or in excess of requirements.

DUMMY.— Pages of a book put together to show the general format of the finished book.

DUODECIMO.—A sheet of book paper 19 by 24 inches folded in twelve leaves is called a duodecimo, or 12mo.

EDITION WORK.— Books bound in large numbers, as distinguished from single books or jobwork.

EYELETTING.— Reinforcing punched holes with brass, zinc or aluminum caps.

FANNING OR RUNNING OUT.—Working out the ends of a pile of sheets for pasting, preparatory to tipping.

FOLIO.—An obsolete term for a sheet of book paper 19 by 24 inches when folded in two leaves; the modern folio size is a sheet 17 by 22 inches.

FORM.—A page or number of pages or plates locked in a printer's chase ready for the press.

FORMAT.— The bibliographical term for the physical size, shape and appearance of a book.

FORWARDING.—An expression covering the operations performed in binding a book up to the time when it is sent to the finisher for tooling, etc.

GATHERING.— Collecting the folded sheets of a book according to the order of the signatures and pagination.

GUARDING.— Tipping cloth or paper to plates and then tipping or folding the end around the adjoining signature. Joining plates together to be sewed as a signature.

GOFFERING EDGES.— Indenting a decorative design on the gilded or silvered edges of a book.

IN BOARDS.—A book is said to be " in boards " when it has the boards attached to the hinges on blank books; tipped on the end-sheets on half-bound books; laced-in on letterpress books.

IN HUBS.—A book is said to be " in hubs " when the hubs have been glued to the spring-back on blank-books, and the book is ready for the leather or other covering material.

IN LEATHER.—A book is said to be " in leather " when the leather is on the book and the book is ready for siding or pasting joint material or end-leaves.

IN ROUND.—A book is " in round " when rounded, and ready for strapping on blank-books; ready for boards on half-bound books; ready for backing on laced-in and case books.

INSERTING.— The act of placing one signature in another, or plates or maps in signatures. The matter so inserted is termed an " inset."

IN STRAPS.—A book is " in straps " when the leather has been glued or pasted on the back of spring-back books between the tapes or bands extending on hinges.

JOGGING.— Straightening paper.

KETTLE-STITCH.— The stitch made at the head and tail of sewn books; a chain stitch. It is made by inserting the needle between the sections, making a loop, inserting the needle and fastening. The different methods are described under the respective sewing heads.

LACING.— Soft twine on which library books are sewed and to the projecting ends of which the boards are

attached after backing. The boards are punctured with an awl, the twine frayed out and inserted. A book so made is termed a laced-in book.

LINING.—A term applied to cased books to indicate the reinforcement of the book with super or crash, and paper which is applied to the glued back of the book before it is put into the covers.

MAKE-UP.—(1) The number of signatures or illustrations or books needed to complete an order or edition. (2) The layout of the book, showing the order of pages and illustrations.

MAKING UP.— The process on blank-books of putting the sections together preparatory to sewing.

MARBLING.—A process of decorating sheets of paper and edges of books with variegated colors in irregular patterns.

OCTAVO.—A sheet of book paper 19 by 24 inches, folded in eight leaves, is an octavo or 8vo.

OFFSET.— The reversed copy made upon a sheet by contact with wet printed matter on another sheet.

OVER-SHEETS.— The signature or sheets remaining after an edition is completed.

PARING.— Reducing the thickness of the leather at the ends.

PUNCHING.— Cutting holes in cards or sheets.

QUARTO.—A sheet of book paper 19 by 24 inches in size, folded in four leaves, is called a quarto, or 4to.

QUIRE.— The term applied to twenty-four sheets of paper.

REGISTER.—When two or more adjacent colors meet without infringing they are said to be in register.

REINFORCING SIGNATURES.— Pasting cambric around or in the fold of signatures for the purpose of strengthening the paper and binding; often done on the first and last signatures of a book because of the extra strain at those points.

ROUNDING.— The convexing of the back with a hammer or machine, at the same time making the fore edge correspondingly concave.

RUNNING OR FANNING OUT.—Working out the ends of a pile of sheets on the end for pasting, preparatory to tipping.

SCORING.— Creasing cardboard or heavy paper so that it will fold neatly at the desired place. This is often done with rules locked in forms, or in perforating machines.

SETTING HEADS.— Bringing the leather over the headband on library books, and covering the convexed edge of blank books with leather from the edge of the spring-back to the edge of the book.

SLITTING.— Cutting sheets apart for inserting plates.

SMASHING.— Compressing folded signatures with a machine to render them more compact for binding.

SPRINKLING EDGES.— Decorating edges of books with small dots or specks of color, sprinkled on with a brush.

STAINING EDGES.—A process of coating or coloring edges.

STARTS.— Leaves which are not properly secured in the back and project beyond the others; breaks between the signatures caused by forcing the leaves when held tightly.

STITCHING.— Fastening sheets together with thread, twine, or wire staples by hand or machine.

STRAPPING.— Gluing or pasting to the convex back pieces of leather cut to fit between the bands and to extend about two or three inches on the sides or hinges of a blank-book.

TABBING.— Cutting a card with an extension for ready reference.

TIPPING.—Attaching paper by applying paste or glue to the end of the sheet or in the fold of a signature.

TURNING-IN.—Bringing the projecting ends of the covering material over the edges of the boards. This projecting portion is termed "turn-in."

TWO-ALONG.— Two signatures sewed with fastening on alternate ends of the kettle-stitch.

VERIFICATION.— Inspection of sheets for imperfections.

STYLES OF BINDING.

BINDER.—A temporary cover arranged so that it may be taken off and attached to subsequent copies of publications. A loose-leaf cover.

BLANK-BOOK.—A book to be written in. Account book.

CARDBOARD OR TAGBOARD, CLOTH BACK.—A stitched or sewed book with cardboard sides and cloth back. On saddle-stitched books the board is reinforced with muslin, then stitched. The board for sewed books is guarded around the outer signatures; for side-stitched books the boards are hinged.

CASE BINDING.—A method of binding books in which the case or cover is made separately and afterward fastened upon the book.

CIRCUIT EDGES.— Bibles and prayer books are sometimes bound with projecting covers turned over to protect the edges. These are circuit or divinity edges.

DE LUXE.— A term applied to books bound with superior materials, with unusual care and design.

DECKLE EDGES.— The rough natural edges of hand-made paper. Deckle edges may also be formed on two edges of machine-made paper. They are poorly imitated by cutting or tearing paper.

FLEXIBLE COVERS.—A book with pliable or limp covers. The leather is tipped to the inner material of the cover, soft gray rag or felt paper, at the back; the sides are left

loose, and the projecting edges are turned in over the edges of the soft paper. These covers are made off the book.

FULL-BOUND CANVAS, FULL-BOUND MOLESKIN.—A blank-book covered with canvas or moleskin, having marble paper end-leaves, spring-back, and hubs. The hubs may be eliminated on cheaper work.

FULL CLOTH.—A book covered with cloth, the cover, termed a " case," being made off the book. Putting the book in the cover is termed " casing-in."

FULL-BOUND, RUSSIA ENDS, AND HUBS.—A blank-book covered with fleshers, having leather ends, marble paper end-leaves, spring-back, and hubs.

FULL-BOUND RUSSIA, FULL-BOUND PIGSKIN, EXTRA HUBS.—A blank-book covered with Russia or pigskin leather, having marble paper end-leaves, spring-back, and extra hubs.

FULL GILT.—A book having the edges of the leaves gilded on front, head and tail.

FULL RUSSIA, FULL SHEEP, FULL ROAN, FULL MOROCCO, FULL SEAL, FULL LEVANT, ETC.— Letterpress books entirely covered with leather, the name of the leather used in the term being the name of the leather used for binding.

HALF-BOUND, LOOSE BACK.—A medium thick blank-book not having the leather back pasted to the back; the cover is made off the book and a piece of manila paper the length and width of the back is laid between the boards on the leather. A piece of fleshers is pasted over the back, extending about one and one-half inches on the end-leaves. Books are cased-in.

HALF-BOUND, TIGHT BACK.—A thin blank-book having leather back and corners, and cloth or paper sides; the leather is pasted to the sections of the book.

HALF RUSSIA, HALF ROAN, HALF MOROCCO, HALF SEAL, HALF LEVANT, ETC.—Letterpress books which

have leather backs and corners, cloth or paper sides, are termed half russia, half roan, half morocco, etc., designating the kind of leather used.

JACKET.—A printed or unprinted wrapper folded around a bound book for protection. A loose canvas or drilling cover made to preserve the binding.

LETTERPRESS BOOKS.— Books having printed reading matter.

LOOSE-LEAF BINDER.—A cover with post fasteners to hold the leaves in place.

PADS.— Sheets of one hundred or more with a piece of pulpboard on the bottom, one edge glued and reinforced with super.

PAMPHLET.—A thin book with or without a paper cover.

PAPER BOARDS, CUT FLUSH.— A book, slightly rounded, the back covered with goat splits, fleshers, or skiver, boards pasted on, and covered with manila paper. The trimming is done after the book is bound.

PAPER COVER.—A stitched or sewed pamphlet to the back of which a heavy paper is glued or pasted; when saddle-stitched the cover and signatures are stitched in the same operation.

PUBLISHERS' BINDING.— Commonly understood as ordinary cloth binding.

QUARTER-BOUND.—A book with the back of one material and the sides of another; back and sides turned in on the boards.

QUARTER-BOUND, CUT FLUSH.—A book with the back of one material and the sides of another; trimmed after the binding is completed.

QUARTER-BOUND, JUTEBOARD, CUT FLUSH.—A binding which consists of marbled or grained boards, hinged with cloth, stapled, with a cloth back and trimmed flush.

TABLETS.— Sheets of one hundred or more with pulpboard on the back, covered with manila paper over the binding edge to the back; or with cardboard on the front, the back covered with cloth.

THREE-QUARTER-BOUND, RUSSIA.—A blank-book having a leather back and corners, canvas, corduroy, moleskin, or cloth sides, marble paper end-leaves, spring-back, and hubs.

PARTS OF A BOOK.

BACKING.— The ridges formed on both sides of the book by spreading the signatures from the center toward the sides with hammer or machine.

BACK LINING.— The loose back made on letterpress books with gray rag or heavy manila paper.

BANDS.— Soft twine or strips of leather glued together and put on the back lining of letterpress books to protect the lettering and beautify the book. A closely woven strip to which the sections of blank-books are sewed.

BLANK.—A page on which no printing appears.

BLANK-BOOK JOINT.— The space on the hinge between the spring back and boards.

BOARDS.—Applied generally to many kinds of heavy cardboard, which are placed on the sides of books.

BOLT.— The closed ends of signatures of uncut books.

CLASP.—A hook or catch for fastening the covers of a book together at the fore edge.

CORNERS.— The material covering the board corners of half-bound or three-quarter-bound books.

DOUBLE FOLIO.— Folio page together with smaller folio inserted within; the whole makes one complete accounting form.

END-LEAVES.— The outer leaves of end-papers which are pasted to the cover.

END-PAPERS.— The outer leaves of books.

FIGURE.—An illustration inserted in printed text.

FLY-LEAVES.— The leaves of end-papers next to the bound book.

FOLIO PAGE.— The two pages of an open account book which make one complete accounting page.

FORE EDGE.— The front edge of a book.

FRONT MATTER.— That which precedes the main text of a printed book; namely, half-titles, title-page, contents, preface, etc.

HALF-TITLE.— The title of a volume appearing above the text on the first page or on a separate leaf immediately preceding the first page of text.

HEADS.— The head-band and the material covering the head-bands on letterpress books; the material covering the convex edge of the head and tail of blank-books.

HEAD-BAND.—A cloth strip, one end of which has cotton interwoven with silk, one-sixteenth to one-eighth of an inch, or a soft twine covered with calico, glued to the back to project at the head and tail to improve appearance. Head-bands are sometimes woven on the book.

HEAD AND TAIL.— Top and bottom of a book.

HINGE.— The tongue made by gluing and folding over the end-leaves on which straps are pasted; this is inserted between two thicknesses of board.

HUBS.— Several thicknesses of strawboard, glued together on the spring-backs of blank-books to strengthen the back and protect the lettering.

IMPRINT.— The name of the printer or publisher affixed to his work.

LOOSE-BACK.—A blank-book not having the covering material pasted to the back; the cover is made off the book and a piece of manila paper the length and width of the rounded back, is laid on the leather between the boards. A piece of fleshers is pasted over the back,

extending about one and one-half inches on the end-leaves, and the book cased-in.

OPEN JOINT.— On full cloth books, space about one-eighth of an inch between the backing ridge and the board.

PAGE.— One side of a written or printed leaf.

PATENT BACK.— Blank-book sections sewed to guards, giving additional strength and permitting the book when forwarded with a spring-back to open flat.

PLATE.— Full-page illustration printed on paper different from that used in the book.

RIBBON MARKER.—A small ribbon placed in a book as a marker.

ROUND.— The convex back which corresponds to concave fore edge of a book.

RUNNING HEAD OR TITLE.— The title of a book or subject placed at the top of each page.

SECTION.—Account sheets folded in the center in lots of four or more preparatory to sewing.

SIGNATURE.—A sheet after it has been folded and is ready to be gathered. It usually consists of sixteen pages, but may comprise four, eight, sixteen, thirty-two, or sixty-four pages.

SPRING-BACK.— Tar-board concaved to fit the convexed back of blank-books.

SQUARES.— Projecting board at the head, tail and fore edge of a book.

TIGHT-BACK.— The covering material which is pasted to the sections after the book is rounded and in boards.

TIGHT-JOINT.—A joint in which the boards are close to the backing ridge and laced to the book, or have tapes pasted between two thicknesses of board.

WASTE LEAVES.— The outer leaves of tight-joint letterpress books, which are removed before the joint

material is pasted to the board. The outer leaves of account books which are made into hinges.

BINDING MATERIAL.

AMERICAN RUSSIA.—(See Cowhide.)

ART CANVAS.—A book cloth known both as Art Canvas and Buckram.

BASKET CLOTH.— This is a fancy weave of cloth, of construction similar to the wicker work of baskets.

BINDERS' BOARD.—A millboard used for binding books (see Clothboard).

BOCK MOROCCO.—A term given to a leather made of sheepskin, finished in imitation of morocco.

CLOTH.— Cloth used for making covers or cases for books. It is made in many different grades and patterns. (See also Cloths.)

BUCKRAMS.— These are the heavier weaves of cloth finished like linens. They should be used on letterpress work whenever the books will receive more than ordinary wear.

BUFFING.— The inner layer of cowhide, taken off by buffing or splitting the hide.

CANVAS.—A heavy cotton cloth, closely woven. (See Duck.)

CALF.— Leather made of the skin of a calf. It has a smooth, uniform surface.

CLOTH.—A stiffly sized and glazed variety of cotton or linen cloth, usually colored and decoratively embossed.

CLOTHBOARDS.—A cheap grade of binders' board.

COMMON CLOTHS.— Before receiving the final coat of color, this cloth is dyed. The thready appearance noticeable in the linen-finished cloths is less apparent on account of the dye and extra coloring.

CORDUROY.—A thick, soft, ribbed fabric, used for covering account books or loose-leaf binders.

COWHIDE.—A coarse leather made from the skin of a cow, commonly known as " American Russia " or " Imitation Russia." It has a slight grain, and is tough and strong.

CRUSHED LEVANT.— Levant morocco with the grain crushed down until the surface is smoothly polished.

DUCK.—A heavy cotton cloth, firmly woven and smooth. (See Canvas.)

DRILLING.—A stiff cotton cloth.

ENAMELED PAPER.—(See Supercalendered Paper.)

FRENCH MOROCCO.—A quality of Levant Morocco, having a less prominent grain than other morocco.

HEAD-BANDS.— Silk or cotton interwoven on the end of a strip of loosely woven cloth. A strip of striped calico pasted around soft twine. These are glued on the head and tail to cover the convexed edge of the book.

IMITATION RUSSIA.—(See Cowhide.)

JUTEBOARD.—A fibrous board, sometimes grained or marbled by printing, used on quarter-bound cut-flush books.

KERATOL.—A waterproof cloth made in imitation of leather.

KIP CALF.— The skin of a heifer, which is stronger than ordinary calf.

LAW CALF.— Uncolored calf leather that is in the natural state, pale brown.

LAW SHEEP.— Uncolored sheepskin used for binding law books.

LEATHERETTE.— Cloth or paper prepared in imitation of leather.

LEVANT MOROCCO.— Morocco leather made from the skin of the Levant goat, having a larger grain than Turkish morocco leather. (See Morocco.)

LIBRARY BUCKRAM.— A special heavy-weave cotton cloth suitable for letterpress books. It is dyed and covered with a light coat of color.

LINEN CLOTHS.— Thready-appearing fabrics which have received a light coat of color.

LITHOGRAPH PAPER.— Colored patterns made by lithographing; used for end-papers and siding the cheaper grade of books.

MARBLED CALF.— Calfskin so treated with acid that it resembles marble.

MARBLE PAPER.— Paper decorated with patterns made by marbling; used for end-papers and siding the cheaper grade of books.

MILL OR BINDERS' BOARD.—A thick, heavy card, used for making book covers. (See Clothboard.)

MOLESKIN.—A thick, soft, smooth fabric used for covering account books and loose-leaf binders.

MOROCCO.—A leather made from goatskins; it is tanned with sumac. The texture is very firm, though flexible. The grain is produced by rolling and folding. Genuine morocco is the most durable binding material.

MOTTLED CALF.—A light brown calfskin, mottled by treatment with acid.

PERSIAN MOROCCO.— Leather made from the skins of hairy sheep called Persian goats.

PIGSKIN.— Leather made from the skin of the pig. It is tough and pliable.

POLISHED BUCKRAM.— Uniformly colored fabric of tensile strength, to which decorations are easily applied.

PULPBOARD.—A soft, cream-colored board used for pads and tablets.

ROAN.— Unsplit sheepskin.

RUSSIA LEATHER.—A leather carefully tanned with willow bark, dyed with sandal wood, and soaked in birch

oil. It is of a brownish red color and has a characteristic odor. Prepared in Russia.

SHEEPSKIN.— Leather made from the skin of a sheep.

SHEET.—A separate piece of paper of definite size; a twenty-fourth part of a quire. In printing, a sheet is defined by its size; in binding, by its fold.

SILK PATTERN.— Embossing in small diagonal lines which gives the cloth a silken appearance.

SKIVER.— The outer or grain side of sheepskin which has been split; much used and mistaken for sheep.

SMOOTH CALF.— Plain or undecorated calf.

SPLIT LEATHER.— Leather split by machinery.

SPRINKLED CALF.— Calfskin treated with acid.

STRAWBOARD.—A dull yellow board used for bound manifold work.

SUPER.—A thin, loosely-woven, starched cloth, glued on the back of books.

SUPERCALENDERED PAPER.—A class of paper to which a glazed surface is given by rolling or calendering.

TAGBOARD.—A thin, tough, cream-colored cardboard.

TAPES.— Strips of tape extending over the back and on the boards to strengthen the binding. Strips of cloth placed between the covers and ends of a stitched book to strengthen the book.

TARBOARD.—A tough and better grade of millboard, containing a quantity of tar; used to make the spring-backs of blank-books.

TEXODERM.— Imitation leather, strong, durable; water, stain and Croton-bug proof.

TITLE LEATHER.—A highly polished thin skiver pasted on title panels. These are stamped or lettered by hand to designate the book.

TREE CALF.— Calfskin treated to resemble the trunk and branches of a tree.

TURKEY MOROCCO.—A strong, durable and expensive morocco made of goatskin from Turkey.

TOOLS AND ACCESSORIES.

AWL.—A tool used to punch holes in boards to lace-in soft twine, thus connecting boards with sewing. Sometimes called a bodkin.

BAND NIPPERS.— Tool used in forwarding to correct irregularities in the bands of books sewn on cords.

BAND PATTERN.—A piece of brass with holes indicating the position of the bands on letterpress books.

BRASS-BOUND BOARDS.— Pressing boards, the edges bound with brass which projects about one-sixteenth of an inch above the surface; used in pressing cased-in books.

BURNISHERS.— Pieces of agate or bloodstone affixed to convenient handles.

CARBORUNDUM STONE.— A stone one side of which is coarse, the other smooth; used to sharpen knives.

CASE GAUGE.—An instrument consisting of two similar steel parts shaped as the sides of right angles. Two sides of the angles are parallel and the other two in a straight line, operating on a steel bar and adjusted with thumbscrews to suit the backs of cases.

COMBS.— Instruments with wire teeth used in marbling. The colors being upon the surface, the comb is drawn across a portion in such a way that a new pattern is developed.

DIVIDERS.— Instrument, consisting of two movable legs, used to measure the distance between bands, in cutting stock, patterns, etc.

FOLDER.—A piece of bone or hardwood about seven-eighths of an inch wide and nine inches long; used for folding paper, turning-in, rubbing down and setting heads.

FORMING IRON.— A piece of iron twenty inches long, six inches wide, and two and one-fourth inches thick, with five distinct channels conforming to circular arcs; used for forming the tarboard for spring-backs on blank-books.

GLUE BRUSH.—A copper-bound brush with four-inch bristles and about two and one-half inches in diameter; used for spreading glue on binding material, gluing backs of books, etc.

GLUE HEATER.—A tank containing glue kettles.

HAMMER, BOOKBINDERS'.—Special hammer, six inches from apex to base, the base being two inches in diameter; used primarily for rounding and backing books.

PARING KNIFE.—A knife about six inches long, the blade of which is ground on one side to a fine edge; used to pare or skive the ends of leather.

PASTE BOX.—A box made of hardwood, the inside being lined with zinc or galvanized iron and having a stick across one end to enable the forwarder to work surplus paste out of the brush into the box.

PASTE BRUSH.—(See Glue Brush.)

PRESSING BLOCKS.— Wooden blocks used to fill up space in a standing press.

PRESSING BOARDS.— Hardwood boards, seven-eighths of an inch thick, put between books, sheets, etc., in pressing.

PRESSING ZINC.— Zinc used between end-leaves and boards to keep dampness out of the leaves.

ROD.—A stick having a semicircular cross-section with one angle flattened; used in pressing the joints of blank-books.

RUBBING-UP STICK.—A piece of hardwood one and one-half inches square and about sixteen inches long; used for rubbing the backs of spring-back books after drawing on the covering material. A grooved stick

which fits the bands on letterpress books; used to work in leather close to the band.

SHEARS.— An instrument for cutting cloth and paper, consisting of two pivoted blades which meet each other.

STOCK KNIFE.—A small pointed knife used in cutting leather, etc.

STRAIGHT-EDGE.—A flat metal ruler.

TURNING-IN STEEL.—A piece of thin steel eight inches long and two and one-half inches wide, rounded on the corners; used to turn in and rub down cloth in making cases.

FORWARDING PRELIMINARIES

STRIPPING BOOKS.

The rebinding of valuable books is at best a necessary evil, and anything that makes frequent rebinding necessary is objectionable on account of the cost involved, and because of shortening the life of the book.

Books which are to be rebound must be pulled apart one section at a time, and all thread, wire, glue, leather and paper removed. Open the cover and cut the twine or tape in the joint to which the boards are attached. On case books take a sharp knife, open the cover and cut the end-leaves and cover through the joint. A pair of diagonal pliers will be found serviceable to pull out and cut wire stitches. In stripping wire-stitched books, open the ends of the staples, cut them close to the paper, and remove one signature at a time.

The best plan is to remove as much of the former binding which adheres to the back as possible. To remove the residue, take a sponge and hot water, or paste the back, and set a while to soak off, then remove the surplus by scraping with a dull knife or folder. While still damp, the sections may be pulled off one at a time after the thread is cut in the center of the fold or the wire staples opened. With the thumb and index finger, the remaining glue on the back is removed from each section.

All heavy plates are guarded; obsolete perforated signatures are provided for the thickness of all maps. If a number of plates are together in any portion of the book, they should either be guarded or creased one-fourth of an inch from the edge of the binding margin, and then whip-stitched. This method will enable all plates to open flat from the creasing.

The work order number should be written on the next to the last page, and initialed by the stripper. This will avoid mixing up orders and will enable the authorities to place the responsibility for misplaced signatures. When dry, all books should be thoroughly pressed before sewing.

MENDING LEAVES.—All mending must be done with the same shade of paper, and if too much patching is not required the blank sheet at the front and back of the book can always be used for that purpose. In patching, the joining edges of the paper should be pared and rubbed down with paste. When a sheet is torn, take a strip of very thin transparent paper and paste over the tear. Clean paste, free from lumps, is essential, and all mending should be done on the back of the page. Worn and damaged periodicals are usually lop-sided; that is, the round is out of proportion, due to the handling in turning over the pages from the beginning to the end. After such books are stripped, the signature backs must be bent in the opposite direction until they lie flat, and then pressed. All signatures which are badly worn in the back should be trimmed and whip-stitched, as it is impracticable to spend time in mending.

REMOVING STAINS.— To take away dirt or mud stains, spread soap jelly evenly on the spots and leave for about one hour. Dip the sheet in clean water, spread it on a piece of clean paper on a table, and remove the soap with a soft sponge. The stain will ordinarily disappear in the sponge. Submerge the sheet in a pan of clean water, then put between blotting paper, and press until dry. In most cases the cleaning with warm water and castile soap will suffice.

Fat stains are removed by laying a piece of blotting paper on top and rubbing it with a hot polisher. This will absorb the grease. Then boil essence of turpentine and apply with a small camel's-hair brush. The whiteness of the paper may be restored with white linen soaked

in pure, warm alcohol. Gasoline or benzine are sometimes used to good advantage.

To remove oil stains, mix five hundred grams of soap, three hundred grams of clay, sixty grams of quick-lime in about a quart of water. Spread this on the sheet, and leave about one-half hour. Dip the sheet in a pan of hot water, put between blotting paper, and press until dry. Strong chemicals should not be used, as they are apt to destroy the paper.

SEPARATING MOUNTED PLATES.— Should it become necessary to remount plates on cardboard, put a piece of paper in a pan of warm water, and lay the plate face down upon it, leaving it in the pan until the plate floats off. Remove the old mount, and take out the plate; put between blotting paper and leave to dry.

SPLITTING PAPER.— If it is necessary to split paper, paste it on both sides, lay between two pieces of muslin, and put in a press between boards until dry. Then take hold of the ends of the muslin, and pull apart. If the sheet is thoroughly pasted, the paper will separate. The muslin is taken off by submerging it in warm water. The paper is then laid on a piece of blotting paper until dry.

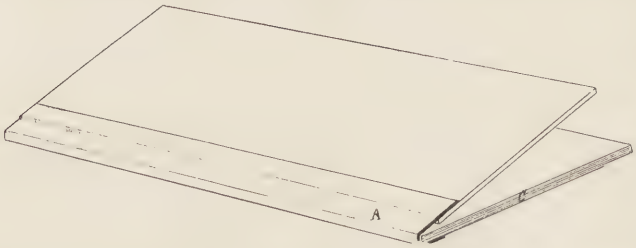
VARNISHED PLATES.— Frequently colored plates are varnished with a material which never dries. In such cases put a piece of wax paper over the plate before pressing. Should the plates stick, take a hot polisher and rub gently over them. The heat will soften the surface and the sheets can be easily pulled apart.

GUARDING.

All eight-page forms printed on thin paper and sewed with machine should be reinforced with a piece of paper which extends on both sides of the fold to prevent tearing.

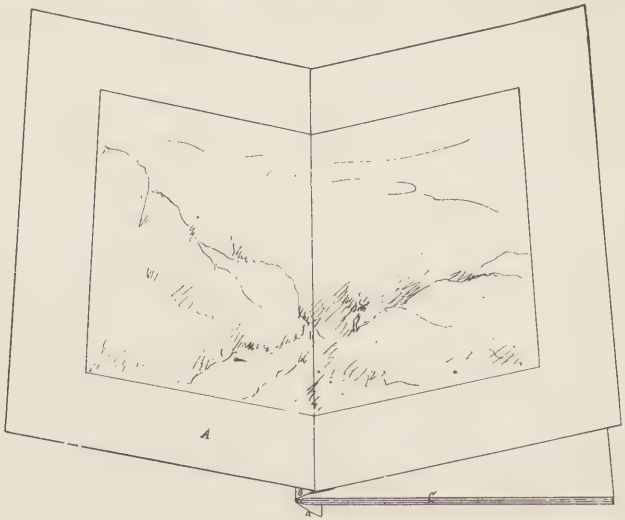
When a number of plates come together, make them into sections with guards by cutting strips of thin paper

one-half of an inch wide and pasting one-fourth of an inch on each plate. Six plates can constitute one section, and the first and sixth are joined together, the second and fifth, the third and fourth. Single plates may be guarded and one-half of the guard tipped around the adjoining



A — Guard. B — Plate. C — Signature.

section. To avoid too much swell in the back, when books contain numerous guards, only thin, tough paper should be used for guarding. The pasted guards must not be



A — Plate. B — Guard. C — Signature.

stretched, as the sheet will wrinkle when dry. Books containing numerous thin plates should be creased one-fourth of an inch from the edge and whip-stitched.

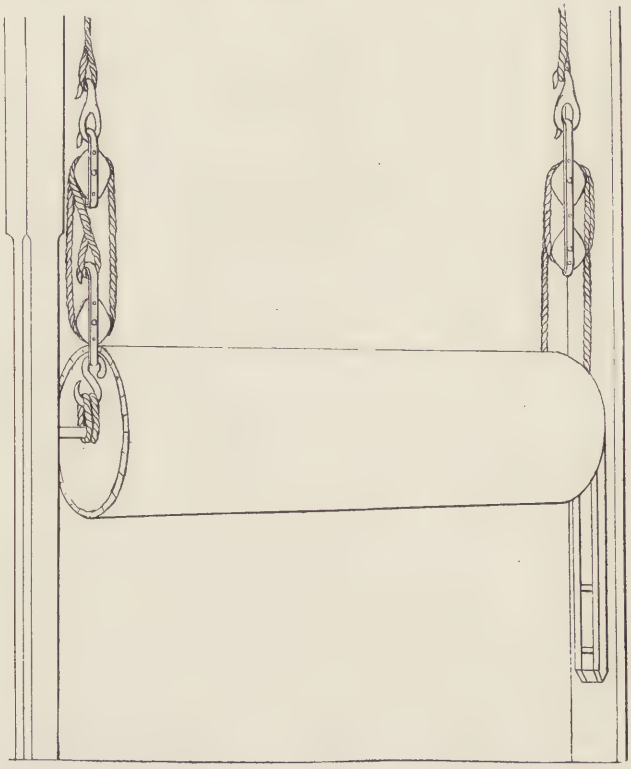
Thick plates should be hinged by pasting a piece of muslin one-fourth to one-half of an inch to the plate, then laying a piece of cardboard one-fourth of an inch wide the length and the thickness of the plate, three-sixteenths of an inch from the edge. Then paste another piece of cloth on the other side, the edge coinciding with that of the first cloth. The remaining cloth is cut three-eighths of an inch from the edge and folded over even with the hinge.

MOUNTING.

To mount thin paper, take a few sheets of blotting paper and lay the mount flat upon it. The paper to be mounted is laid face down on a piece of glass and carefully pasted with thin paste. The paste must be clean, free from lumps, and evenly distributed, or the streaks of the brush will be visible. Rub off all paste beyond the edge of the paper, then put the glass on the mount; the exact position can be seen through the glass. Then rub down from the center to the right and left. Air bubbles must be avoided, but should they appear after the sheet is rubbed down, prick the spot with a pin to let the air out; then rub down again.

MOUNTING ON CLOTH.— The average bindery is called upon to do considerable mounting on cloth. Maps which are in constant use need reinforcing to prevent wearing and tearing. The best material for this purpose is muslin, which is cut about two inches larger each way than the map, and tacked on the bench, floor or wall. The distance between the tacks should be about one and one-half inches, and the muslin should be stretched before tacking. Then take a wet sponge and rub the surface; if left to dry a few minutes, the wrinkles will disappear. The map or paper is pasted with a medium thick paste and laid on the muslin. First rub the hand down the center, then from the center rub right and left carefully, and avoid bubbles. A stubby bristle brush 4¾ by 3½ by 1 is the best for rubbing down. Should wrinkles appear, lift up

the paper, and rub carefully upward or downward until the edge of the sheet is reached. The average bindery is crowded for room, and to save space a cylinder, three feet in diameter and ten feet long, is made and attached to block and tackle on each end. When not in use, this can be hoisted to the ceiling.

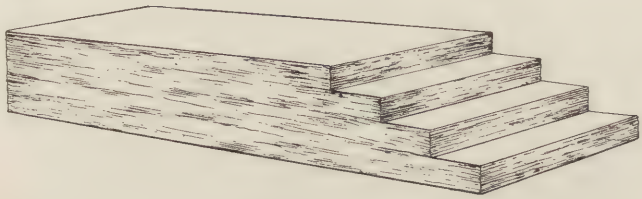


MOUNTING MACHINE.— This machine is designed for mounting pictures, splicing boards and papers. By changing the tympan and substituting sandpaper on the roller, paper can be pebbled. The mechanism consists of a cylinder with nippers, which, at each revolution, catch the picture, which is fed in on the lower plane, carrying

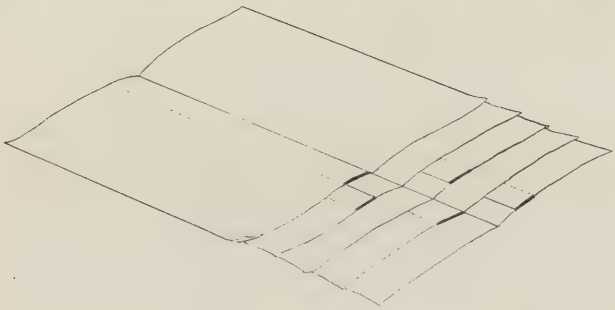
it over the glue roll, and uniting it with the mount, which is fed in on the upper plane. The completed mount is discharged between hot or cold rolls on to the delivery carriage. The speed at which the machine is run is about one thousand per hour.

JOINING LARGE SHEETS FOR REGULAR SEWING.

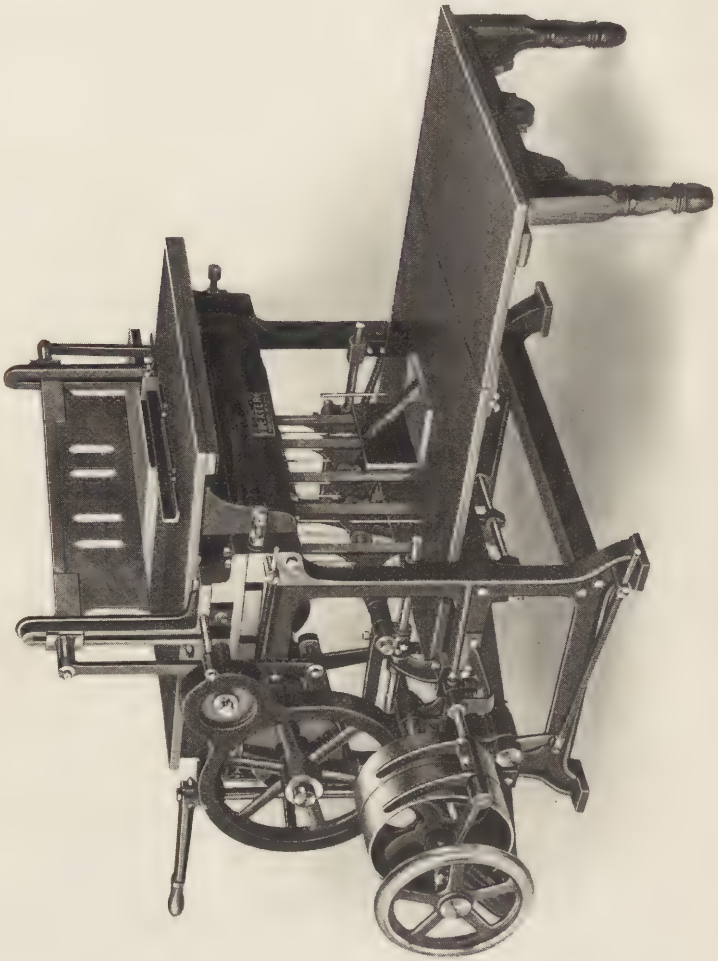
No account book should exceed twenty-four inches in width, which is the standard double medium oblong size, the size of the sheet being 19 by 48 inches. It is prefer-



able to make the book with folio pages; that is, the left and right pages being one complete page, instead of attempting to get all columns on one page. It reduces the size of the book, makes it convenient to handle, and makes a stronger book. An oblong book should be



avoided whenever possible. There are times, however, when this can not be done, and twenty-eight inches or longer may be desired in a single page. These sheets can be joined and sewed in the regular way by allowing



Blank-book Section Folding Machine.

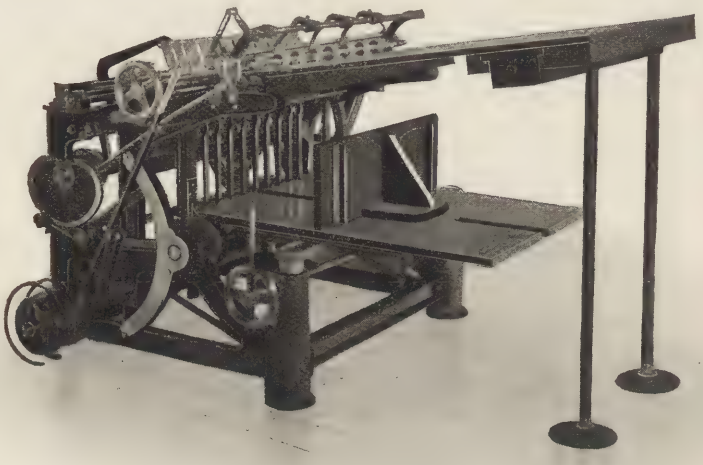
one inch binding margin when ruling. The stock is divided into four lots. Leave the first lot full size, cut off one-half of an inch from the second lot, and fan out about one-eighth of an inch; then glue with flexible glue. Now join by laying the first sheets on, and carefully rub down. Cut off one-eighth of an inch from the third and one-fourth of an inch from the fourth lot; fan out the fourth lot about one-eighth of an inch, and glue. Join the third to the fourth and rub down. When dry, fold the corners of both sheets even, the shortest sheet being on the right side. Insert 3 and 4 into 1 and 2, and repeat once more. This will make a section of eight leaves, with the extra thickness of ordinary tipping reduced by one-half. Care should be taken in gluing and rubbing down, as neatness is essential because of the opening of the book to the fold.

SECTION FOLDING.

Blank and account sheets, as well as books, necessitate making proper division for sewing. The thickness of the section depends upon the character of work. Heavy paper on machine-sewed books should be made up into sections of four sheets. For hand sewing five, and if sewed on guards possibly six, are required. This, of course, depends upon the thickness of the guard. Manifold sheets which are usually printed on thin paper should be made up into sections equal in thickness to four heavy sheets. The character of the paper and the capacity of the sewing machine will suggest the number of sheets to be folded into a section. Count four, five or six, as required. Put the thumb and the index finger against the edges of the left-hand lower corner. Bring the right end of the paper over against the thumb and index finger. Then lay the left hand on top, and, with the right hand run the folder across hard enough to make a sharp crease. Turn the section over, and work the sheets in or out in such a way that the draw of the outside sheets will be equally divided on both sides and that the fold will be in

the center of all the sheets; then run the folder across the paper, and lay aside. Small books in large numbers can be folded two forms to a sheet, which, if sewed on the machine, will cut the folding and sewing time in half. Where strength is desired, this is not to be recommended. Creasing the sheets on the ends and then whip-stitching is preferable.

SECTION FOLDING MACHINES.—The machines designed for this operation are simple and require no expert oper-



Chambers Side-guide Drop-roll One-fold Machine.

ator. The sheets are counted in lots, as desired, and fed to a gauge. A heavy steel blade presses the sheets between a pair of iron jaws, which press the sheets on the end, and rubber-covered rollers deliver them to the receiving table.

The drop roll folds the sections by means of the ordinary folding rollers, and delivers the work with a sharp crease into a packing box. From 30 by 2½ inches to 30 by 12 inches for the size sheet can be folded. The con-

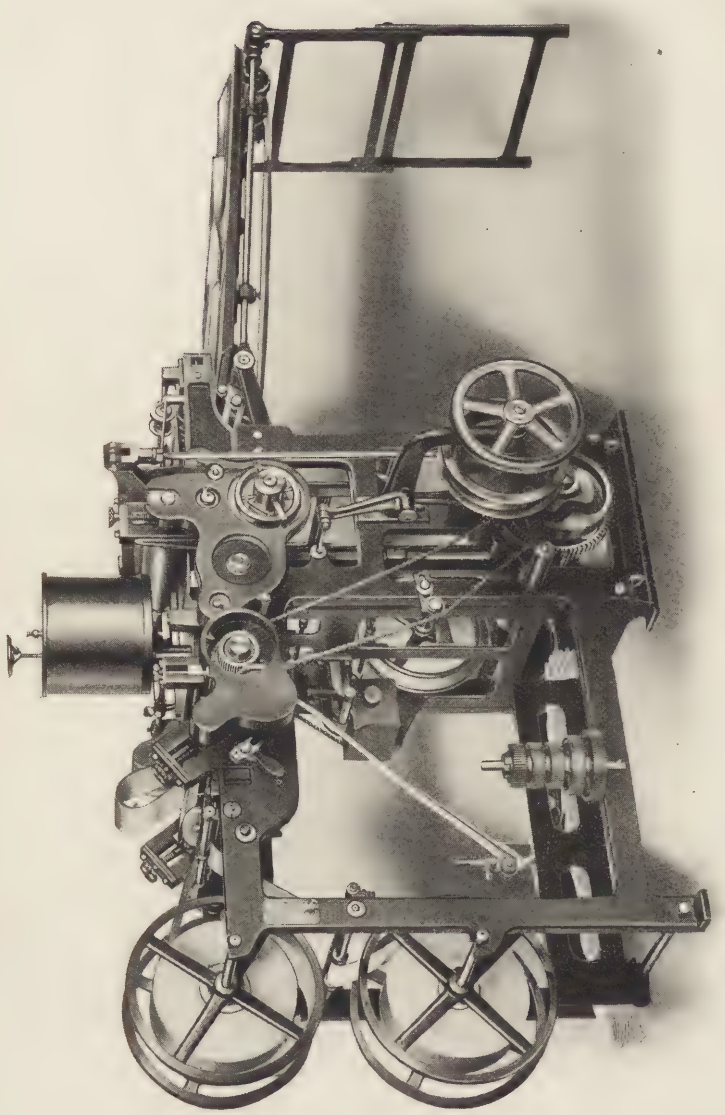
struction and the range of work are such as to recommend themselves to any medium-size bindery.

The machine designed to fold strips from one inch to three inches wide is built on the same principle as the blank-book folder. These stubs are used for scrap-books.

END-PAPERS.

All books except some manifold styles have end-papers to suit the style in which the books are bound. All end-papers have end-leaves, fly-leaves, and some have a cloth or leather strip which covers the joint. End-papers may be plain or may have marbled, colored, or printed paper pasted on the fly and end leaves. Waste leaves are the outside leaves of end-papers, which, when the end-leaves of letterpress books are ready to be pasted to the cover, are removed. No leather, cloth, buckram, or texoderm book which is expected to be used frequently should be bound without a cloth or leather joint. The greatest weakness of modern books is the joint, which cracks long before the outside cover shows any wear at all. The joints of letterpress books get the least attention, notwithstanding the fact that there is more wear there than on any other part of the book. The sewing of the end-sheets to the outer sections is just as essential as covering and embellishing. Because of the constant wrinkling of the fly-leaves in closing the book, it is advisable to paste two thicknesses of paper together, unless, as in the case of case books, a heavy cover-paper is used. The grain of the paper should always run the length of the page, as otherwise wrinkles may result; the grain of the marble paper which is pasted to the fly-leaf should run across the width of the page. This will obviate the curling of the fly-leaf. The style and design of end-papers are matters of individual taste. The aim should be to match the binding material in color.

The printed end-papers are an innovation which bids fair to become permanent. The designs are such as are



End-sheet Stripping Machine.
(Dexter Folding Machine Company.)

in keeping with the context. The color of ink and paper should harmonize with the exterior.

END-PAPERS FOR SIDE-STITCHED BOOKS.— Take a sheet twice the size of the book page and fold it in the center. Cut strips of muslin or linen about three-fourths of an inch wide, apply a medium-thick paste on a wooden board, lay the strips on, place a waste sheet of paper on top, and rub down. Remove the paper from the board, and lift off a strip, placing it parallel with the fold; rub it down, and lay the sheet between strips of paper or pulpboard. When dry, fold the sheets with the muslin in the center. The end-papers are laid on the books so that in the subsequent operation the reinforced leaf can be pasted to the boards. This is an expensive operation, especially when large quantities must be made.

A machine is now in successful operation which will take a sheet from 3 by 4 to 11 by 15 inches, and do from fifteen thousand to eighteen thousand a day. The work is more uniform, and in large establishments such an aid is indispensable. The paper is fed from two rolls; the paper on the reel of the upper roll is the width of the book; that on the lower is about one-half of an inch narrower. The paper is aligned on the front, while the tape runs over a paste roller which is supplied from below. A pressure bar attaches it smoothly, and the end-papers are then cut the desired length. The width of the tape can vary as needed for large or small books.

SIMPLEX STRIPPING MACHINE.— This machine will put strips of gummed cloth on signatures or end-papers. It will apply the cloth folded over the backs, leaving a smaller margin on one side than the other. The cloth can also be regulated to cover both sides alike. It will also apply strips flat on one side. The capacity of the machine is from thirty-five to sixty signatures per minute, and from one hundred to one hundred and fifty per minute. The adjustments can be made in a few minutes.

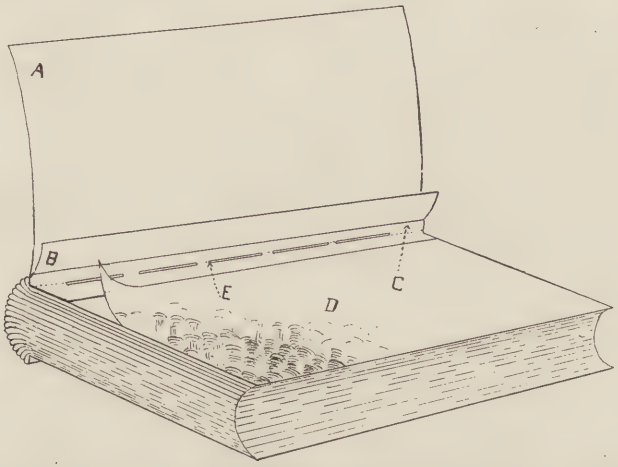
END-PAPERS FOR CASE BOOKS.— The end-papers on plain case books, such as cloth back with paper sides or full cloth, consist of a sheet twice the size of the book page, folded in the middle. The paper must be of the same quality and color as the book. Two sheets are tipped, one into another, and then tipped about one-eighth of an inch on the outer sections. In forwarding, the two outside leaves are pasted together.

To eliminate the pasting together of the outer leaves, binders use a single sheet of heavier paper, folding it, and tipping to the outer signatures. In such cases, care should be taken that the color of the paper harmonizes with the book covering. The tipping on of end-papers can be done before the books are gathered. This will prevent the soiling of the first and last leaves of the book in the subsequent handling. To reinforce the joint, paste a three-fourth inch strip of muslin one-eighth of an inch on the inner pages of the outer signatures, and bring the remainder over on the end-leaves.

END-PAPERS FOR LETTERPRESS BOOKS.— All books sewed on sunken cords, around cords which are to serve as bands, to or through tape, either open or close joint, should have a cloth or leather strip on the end-papers to cover the joint. All books which must be sewed by hand are marked or sawed before sewing. Cut the sheets for the end-papers twice the size of the book page; cut an equal number the size of the book page. Cut the cloth or leather joint one and one-quarter inches wide and the length of the book page. The marbled or colored paper is cut the same size as the book page. Fold the white paper, fan out single white leaves, and tip on the outside of the folded white sheets; this makes the three end-leaves. When dry, fan them out so as to expose about one-fourth of an inch of the single leaf for pasting. Then put the joint material on the pasted portion and put between pulpboards to dry. Then pick up the end-

papers, and fold the last leaf over; this will also fold the joint material.

The end-papers are machine-sewed (Singer machine) through the two fly-leaves, and the one-fourth inch of the cloth joint to one-half of the outer sections about three-sixteenths of an inch from the fold. The stitches should

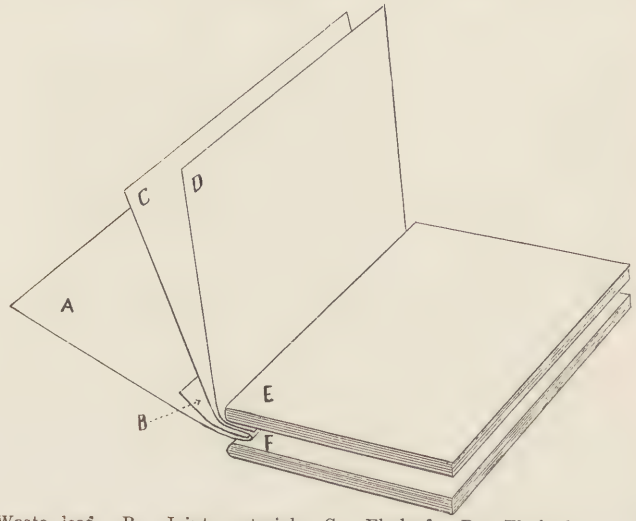


A — Waste leaf. B — Joint material. C — Backing ridge. D — Fly-leaf. E — Thread stitch.

be three-eighths of an inch long, because shorter ones will have the effect of perforation. After the books are sewed, the forwarder pastes the marbled or colored paper on the fly-leaves, covering the thread sewing. This assures strength and avoids the breaks in the back between the first and last leaves of the book. The reinforced fly-leaf prevents doubling when opening and closing the book.

Another method is to make the end-papers in the same manner as above described except that the sewing through half of the outer signatures is eliminated. After the book is backed the end-papers are opened and stitched, through the ridge made by backing, to the first and last signatures, with a colored thread to match the marble or colored paper on the fly and end leaves. This is best accomplished by five double stitches. First, punch five holes, then insert

the needle from the back through the center, or third hole; bring it through and insert in the second hole to the right; then through the first hole. Re-enter the second hole from within, then insert the needle in the fourth hole, bring it through, and enter the fifth hole. Then bring the thread through and re-enter the fourth hole from without; then insert the needle in the third hole. The thread which runs

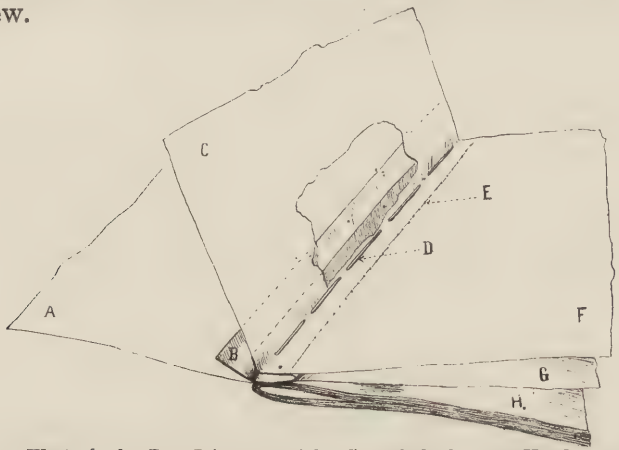


A — Waste leaf. B — Joint material. C — Fly-leaf. D — Fly-leaf. E — First signature. F — Second signature.

from the second to the fourth hole is placed between the thread ends of the third hole, and a knot tied.

Another method of making end-papers is to tip the cloth or leather joint into a folded sheet twice the size of the book page. Then run out the end-sheets one-eighth of an inch and tip them on to the first and last signatures. Bring the end-papers over the fold and crease. If two fly-leaves are desired, another leaf can be tipped on before tipping the end-papers around the signatures. If the first fly-leaf is to be covered with marble paper, it should be done before tipping the end-papers to the signatures.

When the signatures are sewed, the joint material is sewed with them, thus assuring strength. On hand-sewed books, the marking and sawing should be done without the outer signatures. To reinforce the fly-leaves, the cloth can be folded over about three-eighths of an inch, and the folded end tipped in the fold of the end-papers. When the end-papers are tipped to the outer signatures, as above described, it will give one-fourth of an inch on the fly-leaves when the cover is opened. This style is preferable, because it enables the leaves to open from the fold. However, on thick sections the thickness of the leather or cloth and paper tipped to and around the outer sections makes it difficult to back, and on some machines impracticable to sew.



A — Waste leaf. B — Joint material. C — Fly-leaf. D — Hand or machine sewing. E — Machine sewing (Singer). F — Fly-leaf. G — Fly-leaf. H — First signature.

Another style embodies all the desirable features and eliminates all that is objectionable on thick signatures. These end-papers are made off the book. To prepare stock for making end-papers, cut the sheets twice the size of the book page. For joints, cloth or leather may be used; this material is cut two inches wide and the length of the book. The marble paper is cut the length of the book page and one-fourth of an inch narrower than the width. The end-

sheets are folded in the center, and the cloth is folded lengthwise so as to have one and one-fourth inches on one side, and three-quarters of an inch on the other. Fan out the end-sheets one-fourth of an inch from the edge of the fold, then paste. Tip the folded end of the joint material to the pasted portion of the sheet, pick up another pasted sheet, and lay it on the joint material so that the second sheet is exactly superimposed on the first with the folded joint material between the two pasted sheets. Place between pulpboards to dry. Fan out the marble paper about one-half of an inch, and paste. Then paste the top leaf as it lies. Fold back the one-inch portion of the joint upon the newly pasted fly-leaf, and lay the marble paper on top with the pasted portion covering the edge of the cloth.

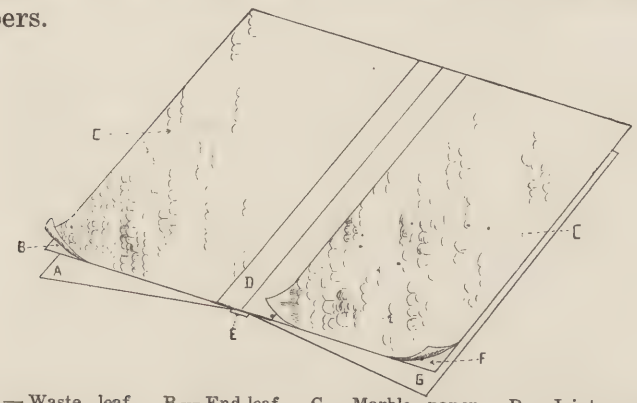
Put the end-papers between pulp or straw board, and press until dry. Then pick them up, take the bottom leaf, and fold over on top of the marble paper, thereby turning back also the one and one-quarter inch portion of the joint.

The end-papers are sewed to one-half of the outer signatures about three-sixteenths of an inch from the fold with a Singer sewing machine through the two fly-leaves which have the fold of the joint material between them. The stitches should be three-eighths of an inch long, because shorter ones will have the effect of perforation. On hand-sewed books, the end-papers may be sewed through the folded fly-leaves and joint, which is even with the back edge of the book. On machine-sewed books, the end-papers can not be sewed in the fold if sewed to the signatures; they may be handled as separate signatures.

END-PAPERS FOR TIGHT BACK ACCOUNT BOOKS.— For half-bound or quarter-bound account books, one sheet more than the required number in the book should be provided for a paste-down. Paste a strip of muslin one-eighth of an inch on the inner pages of the outer sections, and bring the remainder over on the outer pages. Tip a

folded sheet the size of the book one-eighth of an inch on the second and second last leaves, and when dry paste the outer leaves together. This method is superior in strength and economy to tipping the end-papers into each other, then on the outer sections, and pasting the outer leaves together.

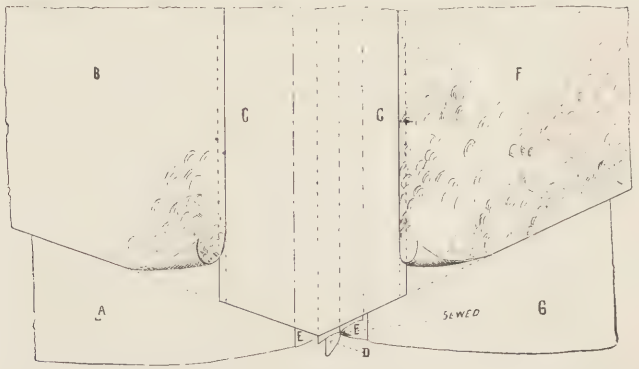
END-PAPERS FOR SPRING-BACK BLANK-BOOKS.— End-papers for blank-books are made by taking two blank sheets the size of the book sheets, and folding them in the center. The white sheets are lined in the fold with a one-half inch linen strip, and put between pulpboards with a strip of paper laid on top and left until dry. If preferred, this lining may be done when the end-papers are otherwise completed; the linen then covers the folds of both end-papers.



A — Waste leaf. B — End-leaf. C — Marble paper. D — Joint material. E — Muslin strip. F — White fly-leaf, lined with marble paper. G — White fly-leaf.

For regular page books, two sheets of manila paper or left-overs of any kind are folded in the center and reinforced in the same manner. The best material for the joint is buckram, which, for books of demy size and larger, should be cut four inches wide and the length of the book, the grain to run the length of the book. Put the folded edges of the white and the manila sheets together, glue the buckram or whatever material is used, and put on so that two inches are on each sheet. Rub down with a folder,

and bring the leaves together with the buckram in between; then rub down again and lay aside. The marble paper having been cut the length, and the width one and three-fourths inches narrower than the width of the book, is pasted lightly and laid on the sides covering the edge of the buckram, and carefully rubbed down with an oiled rag. A drier, consisting of a piece of straw, pulp, or binders' board, is put between the marble paper, and the end-leaves are then put between straw or pulp board, put in press, given a hard nip, then released, and left in press until dry or over night. In pasting marble paper, care should be taken to paste lightly with thin paste, and the paper should not be allowed to stretch before laying on. If end-leaves are to be free from wrinkles, both papers should stretch about the same time, which they will not do



A — Waste leaf. B — End-leaf, lined with marble paper. C — Joint material. D — Guard. E — Muslin strip. F — Fly-leaf lined with marble paper. G — White fly-leaf.

if too many sheets of marble paper are pasted before laying them on. A cold bench adhesive is recommended, and if applied thin and sparingly will give better results than paste. Glue and paste can be mixed together and used to good advantage. While pressing in most cases might be considered superfluous, it helps to produce a flat surface, and the results justify the additional labor.

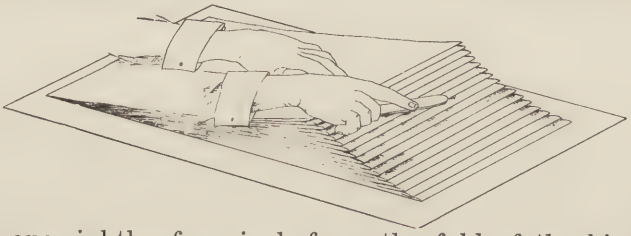
Folio or double-page books should have two sheets printed and ruled on one side only; these are folded with the blank sides together. They are made in such a way that when the end-sheets are sewed to the book, the first page comes into its position as the first page of the book and the last page is at the back. Too much paste will spoil these sheets, as the ink will offset on the blank sides.

END-PAPERS FOR GUARD-SEWED BOOKS.— End-papers for guard-sewed sections made off the book are made the same as described under the preceding head, except that the white sheet is sewed through the linen to a guard, and the folded manila paper is laid to the edge of the folded guard. They are then joined with buckram. The remainder of the operations are continued as described above. One-half of the guard is whip-stitched to the adjoining sections, and then sewed through the fold of the muslin-lined end and waste leaves.

End-papers for continuous guards are made as described in the preceding head.

TIPPING.

All outer sections of printed and blank books are tipped together by pasting the second and second last sec-



tion one-eighth of an inch from the fold of the binding margin. This is done to prevent starts and raveling of thread on machine-sewed books when rounding.

To prepare end-sheets for tipping, fan out the folded sheets about one-eighth of an inch, and paste the exposed portions with a medium-thick paste. Place the left hand on the sheets, and hold the paste brush in the right hand,

working it at an angle with the parallel lines formed by the edges of the fanned sheets. Then lift off one by one, and tip on the outer sections of the books.

On edition work it is preferable that this be done before gathering or sewing, in order to prevent soiling the first and last pages in the subsequent handling.

Case books sewed on twine or tape have the projecting ends tipped or pasted on the end-leaves. Plates are tipped by fanning out about fifty sheets, so as to expose the end to be pasted about one-eighth of an inch, then pasted as above described for end-sheets, and tipped in one at a time.

To tip eight-page signatures, after being folded, the sheets are opened, and, with the edge of a thin piece of binders' board, paste is taken up from a piece of zinc coated with paste and laid in the fold between pages 2 and 7. The sheet is then closed and laid aside.

Eight and sixteen page forms can be tipped on folding machines in one operation with the folding of the paper.

TIPPING MACHINE.— The hand tipping in edition shops is an expensive operation, and the demand is largely met by machines designed for that purpose. It will take any size which can be done by hand, and eliminates an expensive hand operation in tipping end-papers, plates and maps, and will average fifteen to eighteen hundred sections per hour, according to the character of the work.

The end-papers and signatures to be tipped together are laid on two flaps, which fold toward each other, then bring the two sections into contact with a pair of vertical rollers, which glue and carry them forward. A tongue extends beyond the rollers in line with their meeting faces, and separates the lower parts of the end-papers and signatures which are not gripped by the rollers. One signature comes in contact with a wheel which revolves in a tank of cold liquid glue, and applies the adhesive close to the edge of the fold. The end-papers are guided past

the glue wheel without touching it. The two are pressed together by passing between a pair of rollers, and are delivered flat on a descending table.

GATHERING.

After the signatures are folded and bundled, they are placed on a table in consecutive order. The assembling is done by beginning at the last and finishing at the first signature.

To reduce the table room required in gathering thick books, a gathering table may be made as shown in the

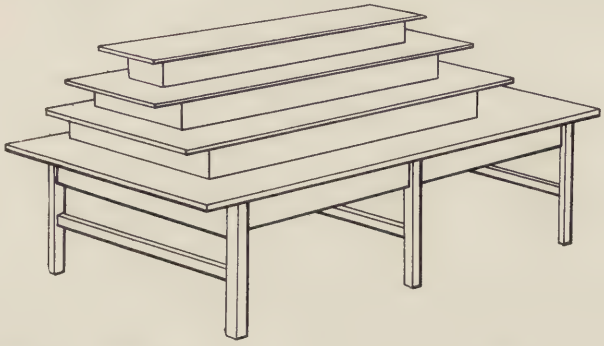
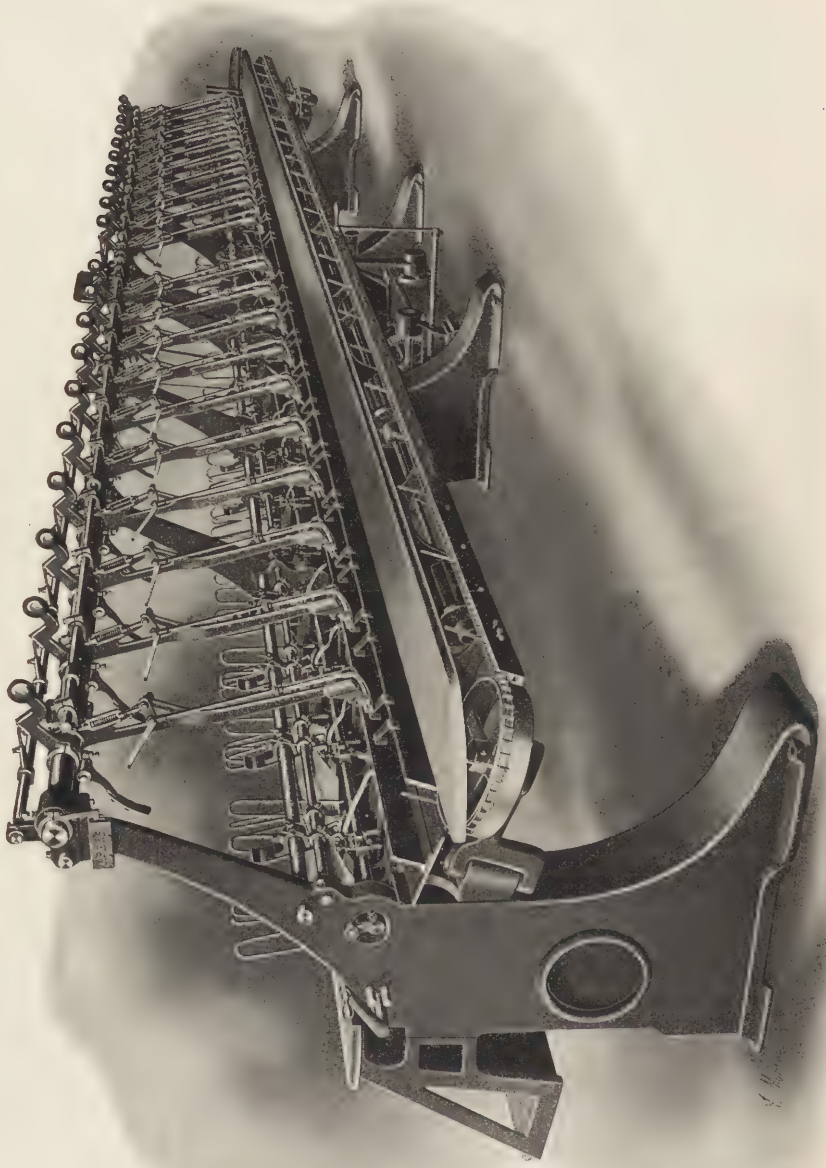


illustration. Two books, one on each side, of more than the ordinary number of pages, can be gathered on this table, which will appeal to any bindery which is cramped for room.

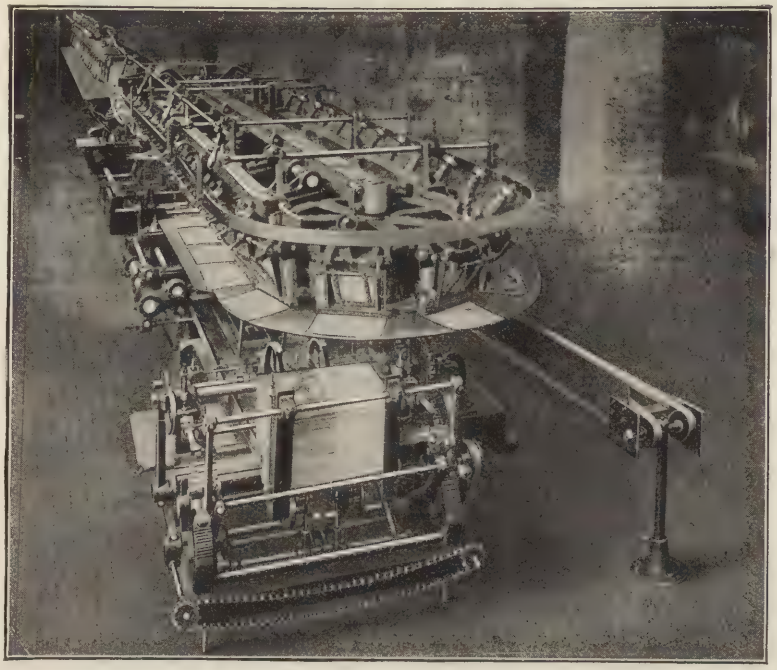
The books when gathered are piled on a platform, and, if a four-point rule has been printed in the back marginal fold step fashion, the collating is done at a glance, and the books are ready for sewing.

Another method is the large round table driven by power. The signatures are laid on top, and the gatherer takes a seat so that the signatures can be easily picked up one at a time. A number of gatherers can be seated around the table and an extra person employed to take away the gathered signatures to the collators. The speed



can be regulated to suit the requirements of the paper and operator. The objection to this is that inexperienced gatherers become dizzy, due to the speed of the table and the constant gaze on the sheets.

GATHERING MACHINE.— These machines can be built with any number of boxes of any size. It requires three operators to run a machine with four boxes, one to place the signatures in the boxes, one to remove the imperfect



Juengst Gathering, Stitching and Covering Machine, capacity 3,000 per hour.

signatures as the machine stops after detecting them, and one to remove the gathered books. The capacity of the machine at sixty revolutions per minute is from twenty-five hundred to three thousand books per hour. The signatures are placed in the boxes in consecutive order, the suckers come up under the different piles and

Juengst Gatherer-Collator-Jogger-Stitcher.

pull one signature down from each pile, at the same time the gripper jaws enter and grasp the same. Then the small hooks on each side of the gripper pass under the pile, over the grasped signature, and lift the signatures in the box to lessen the friction on the one grasped. When the gripper draws the signatures out and drops them in the conveyor upon the preceding one, the chain moves those in the conveyor under the next gripper, and the above action is repeated until the first sheet passes under each pile and completes a book.

The detecting device is operated by the thickness of the sheets in the signature or by the signature itself. Thus, if there is one or more sheets missing, or one or more sheets too many in the signatures, the small hook shown on each gripper arm will catch either on the upper edge or the lower of the notched plate as the signature is thicker or thinner than it should be, and by so catching will cause the machine to stop. At the same time it causes the lever with the indicating ball on its end to rise at the box where the error is, thus giving the operator a signal where to look for the trouble, to rectify which he will place a proper signature where the imperfect one would have fallen, and after removing the defective one from the gripper, start the machine by pulling down on said ball.

When stitchers are attached to these machines, the conveyor changes the position of the signatures from horizontal to vertical, and then passes them in the stitcher.

COLLATING.

After the signatures are gathered, they are examined and verified for misplacements. This is done by taking the gathered book in the right hand on the head and fore edge corner, holding the signatures up, and with the thumb of the left hand releasing one signature at a time, observing the figures at the bottom of the page. If the printer has provided a four-point rule in the marginal

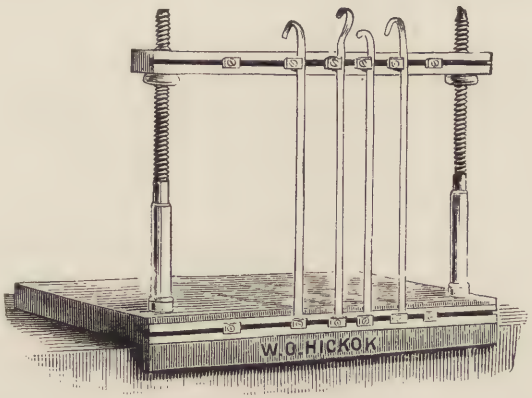
fold, step fashion, the collating can be eliminated, as misplaced signatures are easily detected by looking at the back. When the sections are gathered, the rule will show as a straight line, running diagonally across the back of the book. Any break in the line can only mean that something is wrong, and all signatures not in their proper places may easily be removed and the correct ones inserted.

SEWING.

Books which are to be read, studied, frequently referred to, or to be written in with ink, should be sewed. The marvelous results produced by the book sewing machines of the present age are responsible for the declension of hand-sewing. It is only in small shops that hand-sewing is done to any great extent; however, the necessity for it is governed by the character of work. Odd books, such as magazines and scientific publications which contain numerous plates, should be creased one-fourth of an inch from the binding edge and whip-stitched. If the character of the work justifies it, the plates may be guarded or joined together with paper or muslin, and sewed regularly. All hand-sewed books have a kettle-stitch at the head and tail of the book, which is a catch interlocking one signature with another. If a book is sewn too loosely, it will be flimsy and will show starts. If sewn too tightly, the kettle-stitch on any style of sewing breaks easily in rounding or backing. Experience is required to judge what thickness of thread to use for any given book. If the signatures are very thin, thin thread must be used, or the swelling of the back, caused by the additional thickness of the thread in that part, will be excessive and will make the book too bulky in backing. If the signatures are thick, and a thin thread is used, there will not be enough swelling to back the book satisfactorily. When there are a great many thin sections in a book, thin thread should be used; coarser thread when the sections are thick or few in number. Signatures are sometimes

sewed two-along; that is, two sections are sewed at a time, especially when thin paper is used. This will give on five bands three stitches in each section instead of six, as it would be if sewn all-along.

SEWING MATERIAL.— The cord or twine should be of the best, made with but few strands of long fibres to facilitate fraying out for lacing in the boards. Soft twine, which is commonly used when sunken cords are desired, comes in 2, 3, 4, 5, 6 and 7 ply. If tape is used, it should



be unbleached linen. All thread should also be unbleached, so as to prevent rotting in a comparatively short time. Permanency of binding depends largely on the material used in its first stage; hence the best cord, thread, bands and linen tape should be used in sewing. Haye's Irish linen thread is very popular for book sewing and has given good results. The following numbers are purchasable from any first-class supply house and can be had in 2, 3 and 4 cord: Numbers 12, 16, 18, 20, 22, 25, 30, 35, 40, 50 and 60.

SEWING BENCH.— This is a contrivance upon which books are sewn. The bands or cords are kept tight and in place while the signatures are sewed to them. The bench consists of a bed with two upright screws on which two wooden nuts operate to raise and lower the cross-bar.

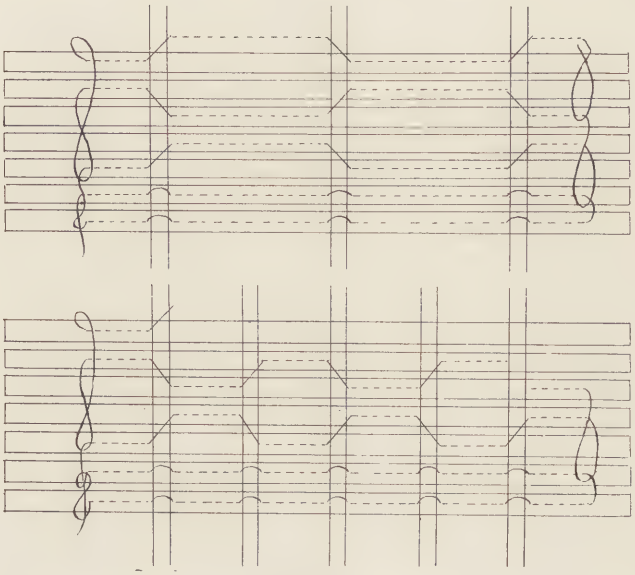
SUNKEN CORDS, ALL-ALONG.— All signatures sewn with sunken bands are jogged with a piece of binders' board on the sides, and put in the backing machine. Then, with a back saw, incisions are made for the cords and kettle-stitches. All cord incisions must be the depth of the cord used, and those of the kettle-stitches just enough to be visible in the inner sheet of the signature. "All-along" is the term applied to sewing in which the thread is carried from one end to the other and locked in both kettle-stitches. The bench is prepared with as many cords as desired, and the sewing executed in the following manner:

The cross-bar of the bench is screwed up to the proper height. Cut as many cords as required; the length is governed by the style of binding. Laced-in or library bindings require three inches, or one and one-half inches on each side, in addition to the thickness of the book. Case books require two inches, or one inch on each side, in addition to the thickness of the books. The cords are tied to the cross-bar with a slip knot, which can be readily untied and should be set as far to the right as possible to have room for the left arm on the inside of the left upright. The other end of the cord is then wound around a key, which is pushed lengthwise through the slot in the bed of the sewing bench, and then turned crosswise below, so as to remain in that position. The cords are adjusted to correspond with saw incisions in the back of the book, and the cross-bar of the sewing bench is screwed up by turning the wooden nuts on each screw until the cords are tight. Place the bench near the edge of a table of suitable height. Then sit in such a position that the left arm rests on the bed of the bench. In the preparation of work, time can be saved by sewing as many books as the bench will hold before preparing for another lot. Take the first signature of the book, and place it face downward on the bed of the bench so that the several cords enter the saw incisions, head being at the right hand. For instruction in sewing, the cord or band side which is nearer the head is

referred to as " the far side," that nearer the tail as " the near side." Pass the needle into the end-papers for kettle-stitch at the tail of the book, then pass along the middle of the signature and out at the near side of first cord. Then put the needle in on the far side of the cord, pass along the middle of the signature to the center cords, and out on the near side. The needle again enters on the far side of the cord, passes along the middle of the signature to the third or top cord, and is brought out on the near side. Then insert the needle on the far side of this cord, pass along the middle of the signature, and bring it out at the head kettle-stitch. The thread runs along the center of the signature from kettle-stitch to kettle-stitch, except at the cords; there it passes around the outside. The thread is then drawn tightly, about one inch of the end being left protruding from the lower kettle-stitch. Insert the needle at the top kettle-stitch of the second signature, and proceed in the same way as with the first signature, but from right to left. Bring the needle out of the opening for the lower kettle-stitch and pull the thread tight. The thread is then tied twice to the end thread left hanging from the kettle-stitch of the first signature. Repeat the operation for the third signature until the head kettle-stitch is reached, then place the needle between the first and second signatures, loop the thread, pass the needle through, and tighten. Repeat operation for the fourth signature, and insert the needle at the tail kettle-stitch between the first and second signatures, loop the thread and tighten, then insert the needle between the second and third signatures, loop the thread and tighten ends until the book is sewed. Repeat the sewing of signatures and fasten the stitches on the ends in the same manner, catching each section twice in the kettle-stitch, until the book is sewed. In joining thread, the knot must always be in the signature, as a smooth back is required. Sunken cords are used on letterpress books, but they are not as strong as when sewn to cords,

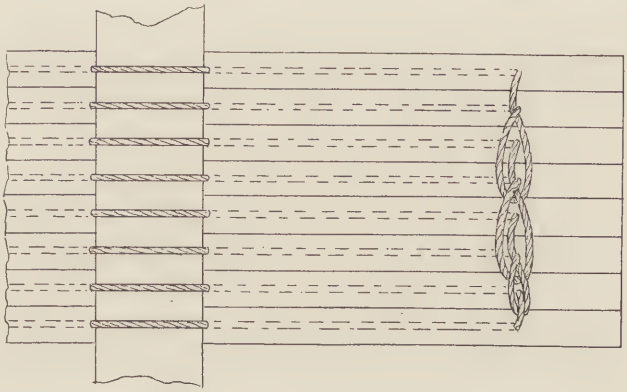
to tape, or through tape. Books so sewn open more freely than is possible with sunken cords.

SUNKEN CORDS, TWO-ALONG.— Thin signatures are sewed two-along, which means that two signatures are sewed with but one fastening in the kettle-stitch. This is done to obviate the swell in the back. The number of cords on which books are to be sewn is governed by the length and character of the book. In sewing two on, the



first and second signatures are sewed all-along; then lay on signature 3 and pass the thread from the tail kettle-stitch of 3 to the first cord along the center of the signature, and bring out on the near side of the cord. Put a folder in the middle of the signature for convenience in passing the needle. Lay signatures 4 and 3, and sew from the far side of the first cord to the near side of the third cord; then the middle of signature 3, which is easily found by the folder, is sewn along from the third cord to the head kettle-stitch. Two signatures are thus

secured by a single passage of the needle from tail to head, or vice versa. These two signatures are secured at the head or the tail by a kettle-stitch. This is done by passing the needle under the signature already sewn, up through the loop thus formed by the thread, and then by pulling upwards until the knot is drawn tight. Care must be taken to keep the stitch in the marked cut, and that it does not tear the back of the signature. When the needleful of thread is finished, tie the second needleful to the first so that the book is sewn with a continuous thread.



This sewing can not be recommended when permanency is desired. It is then preferable to crease and whip-stitch the signatures.

SEWING ON BANDS OR TAPE.— Books to be sewn on bands or tape are placed between two pieces of binders' board, jogged at the head and back, and placed in a backing machine, or on the edge of the bench with a weight on top. The number of bands or tapes to which books are sewn is governed by the length of the book. Books twelve inches in length require three bands; from fourteen inches to eighteen inches, four; from nineteen inches to twenty-three inches, five bands or tapes. If four bands are desired, take a pair of dividers and divide the length of the back into five equal spaces; this will give four

bands. Center the band on the mark and mark the position for the width. Take a piece of board, lay on the back close to the mark, and with an awl or knife scratch the sections just enough to penetrate. This operation is performed without the end-papers. Cut the bands three inches longer than the thickness of the book. If sewn on tape on a bench, provide two inches plus the thickness of the back. When several books of the same size are to be bound, they should be in one stack. The tapes or bands should be kept sufficiently long for this purpose, drawn out between the volumes, and cut off so as to leave about one inch of tape or band projecting at each side of each book.

Place a section on top of the end-papers, mark the position of the bands, lay the front end-papers on the bench, insert the needle at the head kettle-stitch, place the left hand between the fold, take the needle, and thrust it out from the far side of the band. Then take the needle with the right hand and insert it on the near side of the same band; this brings the thread over the band. Take the needle with the left hand, and insert it in the mark on the far side of the second band, taking it with the right hand; repeat the operation for each band. Take the first section, place it on top of the end-papers with the head to the right. Insert the needle into the mark for the tail kettle-stitch, take it with the left hand, and insert at the near side of the band. Take the needle with the right hand, insert between the band and the thread of the end-papers, and then insert at the far side of the band; repeat the operation as described until the head kettle-stitch is reached. Then pull the thread and knot to the projecting end. Lay the second section on top of the first, and proceed in the same manner from the head to the tail kettle-stitch. Insert the needle between the end-papers and the first section, place the needle in the loop and fasten. Take the third section, repeat the operation until the head kettle-stitch is reached, then insert the needle between the

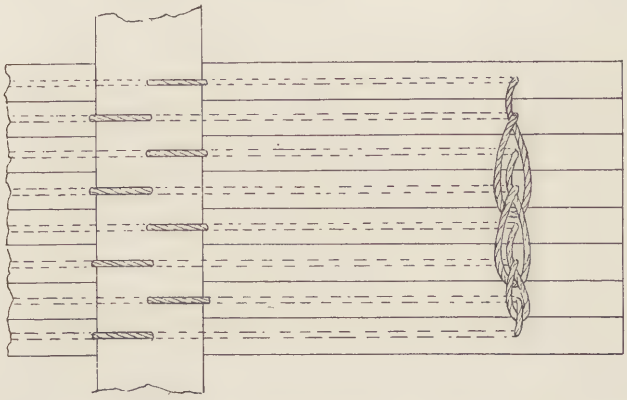
end-papers and the first section, insert the needle in the loop and tighten. Then insert the needle between the first and second sections, and fasten in the same manner. Subsequent sections are treated in the same way, and when the last section and the bottom end-papers have been reached, the kettle-stitches receive an additional catch.

The kettle-stitches on all blank-books are reinforced either with two thicknesses of thread or with soft 3-ply twine, which is inserted in the loop before fastening. When sewn, the ends are frayed out and tipped on to the end-leaves. The band may be encircled by the thread on large account books; this is done by passing the needle from the near side to the far side, and then into the near side, and continuing to the next band. In joining the thread, place the knot in the signature on all tight and loose-back books and on the band on spring-back books. A few experiments will demonstrate that the kettle-stitches pull the head and tail of the book together, and the thread swells the middle. Care must be taken that the kettle-stitches are not pulled together too tightly. The swelling in the center should be counteracted by frequently beating the signatures with a heavy folding-stick.

This sewing excels the sunken cords in strength, and permits a freer opening; it recommends itself in all cases where durability is the prime requisite.

SEWING THROUGH TAPE.— This method allows a book to open flat, is superior to sunken cords, and the saw cuts and cords are not visible. Jog the book, and mark it out with a knife or awl. One mark is made on each side of the tape and one for the center of the tape, together with marks for kettle-stitches at the head and tail. All marks should barely penetrate the inner sheet of the signature. Pass the needle in at the head kettle-stitch, the left hand inside the signature, taking the needle and thrusting it out of the far side of the first tape. With the right hand the needle is taken and thrust through the center of the

tape and signature, then taken by the left hand and thrust through the far side of the next tape. This is repeated from tape to tape to the tail kettle-stitch. The edge of the tape is alternately covered with the thread on the outside of the signatures. A book so sewed, which is bound consistently in other respects, should outlast the best



paper. Blank-books are strongest if sewed with a reinforced kettle-stitch.

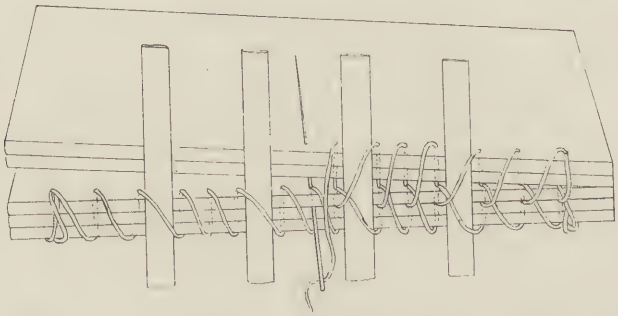
SEWING ON CORDS.—All books sewed on cords are marked for the needle with a knife or awl enough to be seen in the inner fold of the signature. They are usually sewed on four or five cords, which serve a double purpose as bands in the bound book. The sewing is the same as described for bands or tape in the preceding head.

The ancient binders sewed all their books in this way, but with the highly-developed taste for gilt backs, sunken cords and loose backs were later substituted.

WHIP-STITCHING.— Books made up of all single leaves must be whip-stitched. Before sewing, the back should be glued. A sufficient number of leaves, usually sixteen pages, are counted into sections and separated from the pile. These should be creased about one-fourth of an inch from the binding edge; thus creased, the book, when

sewed, will open flat. A book treated in this manner, and each section pasted before another is sewn on, will produce a rigidly-bound book. The weakest point of all whip-stitched books is in the end-papers; therefore, they should have a cloth joint and be sewed to the first and last sections on a sewing machine about three-eighths of an inch from the back edge. The back can be whip-stitched in the regular way, and the tipping on of end-sheets is obviously eliminated.

The habit of whip-stitching the first and last sections is obsolete and does not give the strength claimed without reinforcement with muslin. When the sections are ready, put the book between boards and in the backing machine. Make the incisions with a back saw as previously described. To facilitate whip-stitching, the sections can be stabbed with a shoemaker's awl where the needle enters. The needle is passed into the end-papers at the



head kettle-stitch through the joint between the fly-leaves and sewed all-along to the tail kettle-stitch. Lay the second section on the first and thrust the needle through the binding end of both sections from below. Bring it out on top and thrust the needle half-way between the kettle-stitch and first band tape or cord. Repeat this on the near side of the band, then the farther side, then half-way between that band and the next; continue until the head kettle-stitch is reached. Tie a knot with the pro-

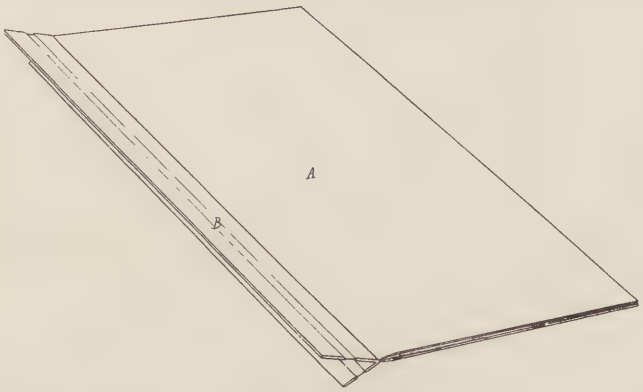
truding end of thread, then lay the third section on the second, and overcast these two in the same manner as described for sections 1 and 2.

Where the cost of production will not permit cloth or leather joints, the outer sections should be reinforced with a strip of muslin three-fourths of an inch wide. The sewing is through this muslin, which greatly strengthens the weak points of the book. The end-papers are tipped enough to cover the muslin. All stitches, when the sheets are not creased, should be in line with each other, because if some should be deeper, the leaves will tear in opening the book.

Blank-book end-papers are sewed through the linen of the white fly-leaf to the outer sections on a sewing machine. The sections should be creased from three-eighths to one-half of an inch from the binding edge, and the kettle-stitches reinforced, as described in the chapter on sewing to bands or tape. The sections should be pasted on each other as they are whip-stitched. The end-sheets are sewed through the fold of the white fly-leaves and the manila paper, both of which should be previously lined with a strip of muslin.

SEWING ON GUARDS.—All sections sewed to guards for the purpose of producing a flat-opening book are sewed with linen thread on a sewing machine through the fold and the middle of the guard. These guards when folded are from one-half to three-quarters of an inch wide. Continuous guards when folded together are from one-fourth to three-eighths of an inch wide. The three end stitches at the head and tail are doubled on the machine, and the ends are tied and cut to project a trifle beyond the folded guard. They are then folded together, and the books are pressed to reduce the sewing swell. After pressing, the books are jogged between two boards, and marked or sawed for bands and kettle-stitches. Books from cap to medium (fourteen to eighteen inches) have four bands, while from royal up they have five bands.

These bands are usually from five-eighths to three-fourths of an inch wide, and are sold as " bookbinders' bands." They are closely woven with a strong fiber, and are highly satisfactory for this purpose. One side of one single guard is whip-stitched to the adjoining side of the next



A — Section. B — Guard.

through one-half the width of the guard, carrying the thread around the bands. The thread is locked in the kettle-stitch near the ends of the book.

Continuous guards are sewn all-along, beginning with the bottom section and carrying the thread between the

Spring-back Guard-sewed Book, Termed Patent Back.

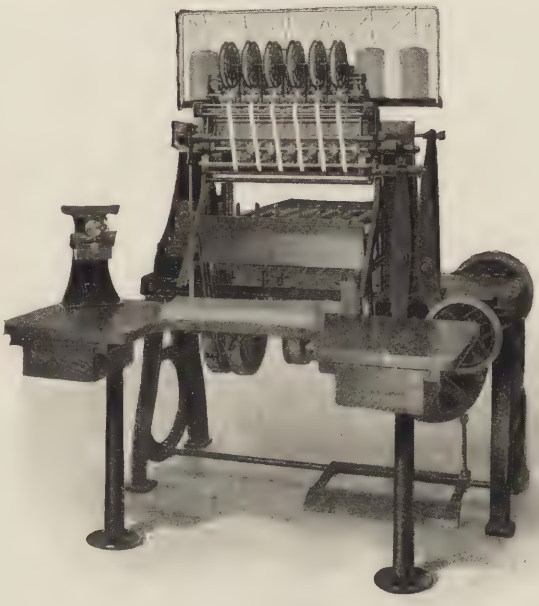
sections in the fold of the guard and around the outside of the band. The thread is locked in the kettle-stitch near the ends of the book. The end-papers are made off the book and sewed on the machine in the folds of the guard

next to the first and last sections. The sewing of the end-papers is in the fold, which has been previously reinforced with muslin, between the white fly-leaves. On the sides a projection of about two inches of the guard is left to be made into a hinge in a subsequent operation.

BOOK SEWING MACHINES.

These machines are made in different sizes and styles, for use on both letterpress and blank books. Each machine takes the place of from four to ten women hand sewers, depending on the nature of the work. The signatures are placed on the feed arm, which is provided with punches. The feed arm rises and carries the signature into the machine under the needles; the punches pierce the signature from the inside. Through these holes the threads are carried by the needles, which also carry the threads through loops of the previous stitches, thus locking the stitches. The needles then retire to their normal position, leaving double thread stitches. The operation is repeated for each signature; thus each signature in turn is sewed to those previously sewn. The number of signatures a book may contain is unlimited. Signature is sewed to signature and book to book. They are separated by cutting the stitches between the books. By reason of the double stitch, the act of severing one book from another does not prevent locking the last stitch, as each book is complete in itself. Each needle is threaded separately, and each stitch is complete in itself. In order to remove a signature from the book, every stitch must be cut. Plain sewing, sewing on tape, crash, or twine, raised or sunken bands — in fact, every kind of sewing known to the bookbinder — can be accomplished by machines. The product is limited only by the capacity of the operator to supply the machine with signatures. Small blank-books, memorandum-books, diaries, copying-books, etc., can be sewed two or more on and cut apart after being sewed, thus materially reducing the cost of production.

CURVED NEEDLE MACHINE.— There are two styles of curved needle machines — the straight feed and the revolving feed arm. The straight feed machine is designed for large and heavy work, such as blank-books, letter copying-books, and large dictionaries. It will do plain sewing without tape or twine, or will sew on various widths of tape, parchment substitute, and on raised

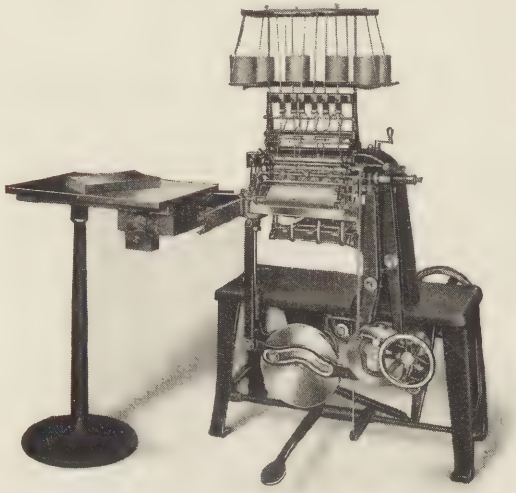


Smyth No. 8 (Improved Old No. 4).

or sunken bands. If sunken bands are desired, the signatures must be sawed out for the bands. On all other kinds of sewing no previous preparation of the work is required. The stitches are about one and one-half inches long. From one to six stitches can be put into each signature, depending upon its length. The position of the stitches is adjustable. When tapes or bands are used, a separate braiding thread is used and braided over the tape or twine from one signature to the other, and locked

around the sewing thread on the inside of the signature. The average production varies greatly, according to the class of work — from eight hundred to eighteen hundred signatures per hour. Cotton, linen or silk thread may be used.

The revolving feed arm style of machine is made in two models, Nos. 3 and 7, and has four radial arms. The needles in No. 7 are adjustable in relation to each other. This machine will sew signatures from 2 by 5½ inches to 7½ by 10½ inches, and is designated to run at a



Sewing Machine — Smyth No. 7.

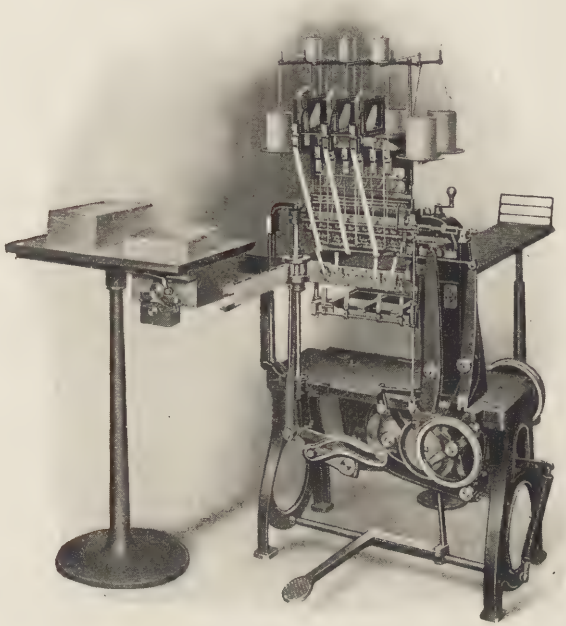
speed of seventy to eighty signatures per minute. The style of stitch made on this machine is what is known as " on and off " or two-along, each pair of threads being interlooped, one thread of each pair going into every other section and the other thread into the alternate ones. On thick books made up of thin signatures, where it is desirable to avoid the swell, the advantage of this style of stitch is apparent. These machines do either plain sewing, sewing through tape, or over raised or sunken cords. No sawing out or previous work is required,

except when it is desired to do sunken band work. An attachment is furnished as part of the regular equipment, which does raised band or sunken band sewing in a most

Specimens of Sewing from New No. 3 Smyth Sewing Machine.

satisfactory manner without the employment of any auxiliary threads. An attachment for doing the sewing through crash can be had.

The improved No. 3 is in more general use than any other style owing to its larger range in sizes (2 by 2½ to 9 by 12) and greater variety of work. It makes what is known as an "all-along" stitch at the rate of about 2,000 sections an hour.

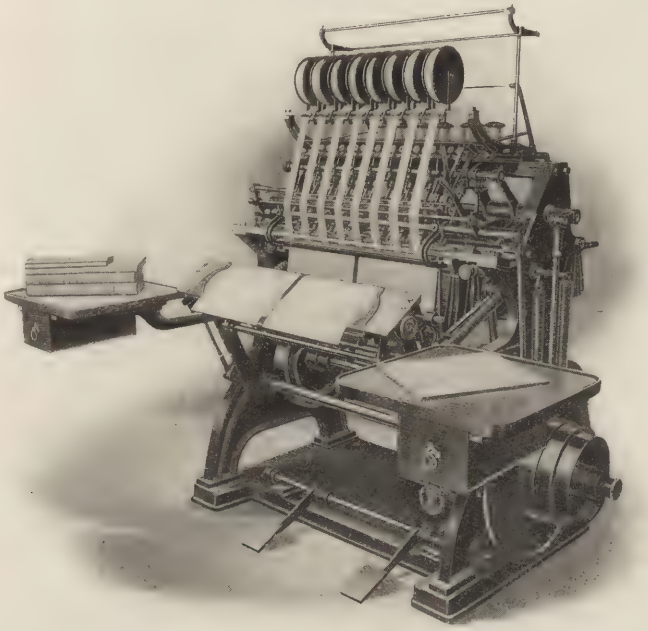


Improved No. 3 Smyth Sewing Machine.

The illustration on preceding page shows the different styles of sewing that can be produced on this model.

STRAIGHT NEEDLE MACHINES.— These have independent sewing heads, adjustable transversely in the machine so that the stitches may be made closely together in the book, or spaced apart, according to the size and character of the work to be sewed. The parts are few and are all open, in sight. The feed arm consists of two heavy steel plates, set at right angles to each other. The take-up

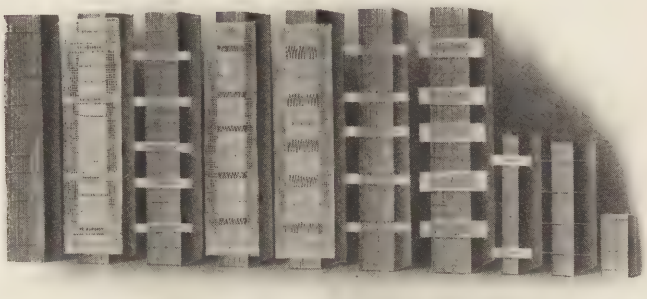
devices produce a firm and even sewing, and can be adjusted for tight or loose sewing. The section to be sewed is thrown over the feed arm to a gauge, and carried up under the needles. The motion of the feed arm is such that, on pasted sections, the line of paste is brought in squarely against the preceding sections, and paste will



Sheridan Sewing Machine.

not scrape across the face of the section. A stitch may be dropped between books, practically locking the thread, and rendering the pasting on of the last section unnecessary. It is safer to tip on the last section in order to prevent the book from unraveling. It often happens on fine books or coated or enameled paper, that it is not desirable to use any paste between sections. In such cases the end threads may be locked through the last loop, and, when

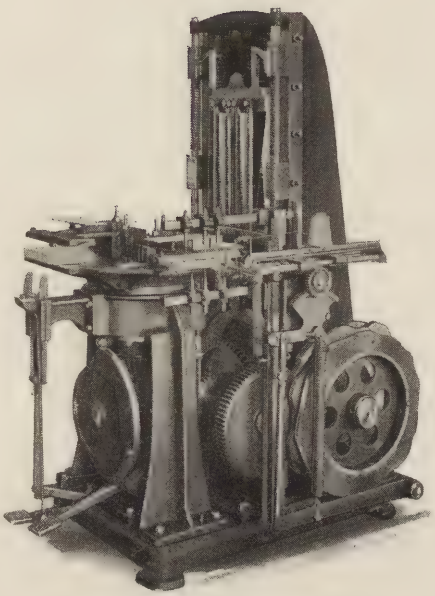
lining up, fastened down the books. Sewing through tape is stronger and better than to tapes, as the tapes will not pull out. These machines will sew with or without tapes, and with or without crash or super, or with tapes and super.



Specimen Sewing on Straight-needle Machine.

WIRE SEWING MACHINES.— This machine has been on the market for many years and is designed to sew sections to super or tape. The sewing is rigid and compact. The objection to this style of sewing is that the wire rusts and rots the sections, especially when such books are used in damp climates. For the tropics, this is unserviceable and should not be used. Brass wire will somewhat ameliorate the objection, but the sewing of books with wire should be relegated to the background as impracticable either for letterpress or account-books.

BACK BOOK-SEWING MACHINE.— This machine will sew books through the side from one-fourth to two inches in thickness, from five to eleven inches in length and up to nine inches in width. The capacity of the machine is from four to six books per minute regardless of the number of signatures to the book. The adjustments are very simple and require no expert operator. This method of sewing is largely used on school books.



Samson Back Book-sewing Machine.
(S. B. B. Machine Co., Reading, Pa.)

Sample of work from Samson machine.

FORWARDING

PASTE.

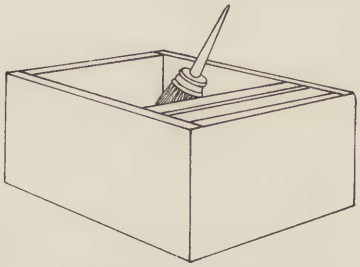
The most common article in a bindery is paste, and the forwarder's success depends upon its judicious use and correct preparation. Paste can be purchased in barrels from paste manufacturers, but some prefer to make it. This is best accomplished in the following manner: The best cooking plan is to have a vessel made of copper large enough to fit inside the glue tank; cut a mixing and beating stick wide on the end and round for the handle. Put the wheat flour in this vessel, and gauge the quantity by the size of the vessel. To this add carbolic acid, salicylic acid or formaldehyde, two spoonfuls to one-half pound of flour, a spoonful of resin, a few drops of oil of cloves, oil of wintergreen and oil of sassafras. The oil ingredients are added to keep the paste sweet. Add water gradually, mix well, and beat out the lumps; this is best done when it is a little thick. When all the lumps are dissolved, add water gradually, and mix well before more is added, otherwise lumps will result. When the mixture is reduced to the consistency of cream, put the vessel into the tank, and turn on the heat full force. The mixture must be stirred until the whole thickens to prevent the bottom from thickening first. Set aside to cool. To prevent a crust forming on top, take two or three pieces of burlap, saturate in water, and put on top. Paste can be made with direct steam by inserting a pipe in the vessel and turning on the steam. The stirring must be continuous, as it thickens rapidly.

Sour paste should never be used, as the fermentation is injurious to leather and invites the growth of molds and bacteria. Pasted material should never come in contact with iron, as it will stain.

To prevent the premature destruction of books by book worms, add to the paste, before boiling, one part of corrosive sublimate to one thousand parts of water, in addition to the other ingredients mentioned.

For white paste used in transparent mending, substitute starch, rice or corn flour.

Paste pots are a source of annoyance when left to the careless worker. Cleanliness in handling paste is as essential as for glue, and pots should be thoroughly



Wooden Paste Box.

cleaned once a week. The ideal paste box is a wooden box twelve inches square and five inches deep, with a strip of wood across six inches from one end, to rub out the paste into the box. This box, when lined with zinc, fills all the requirements of modern establishments.

MOUNTING PASTE.— Take one-fourth of a pound of flour, mix with water gradually; at the same time beat out the lumps, and reduce to the consistency of cream. Then add one and one-half ounces of dissolved gum arabic, one teaspoonful of carbolic acid, salicylic acid or formaldehyde, and one ounce of acetate of lead. A teaspoonful of oil of wintergreen and sassafras can be added to sweeten it. The vessel containing this mixture is placed in a tank of water, and heated until it thickens. It must be stirred to prevent burning.

Another paste can be made by adding to the gum arabic, glucose or gelatine, and substituting rice starch for flour.

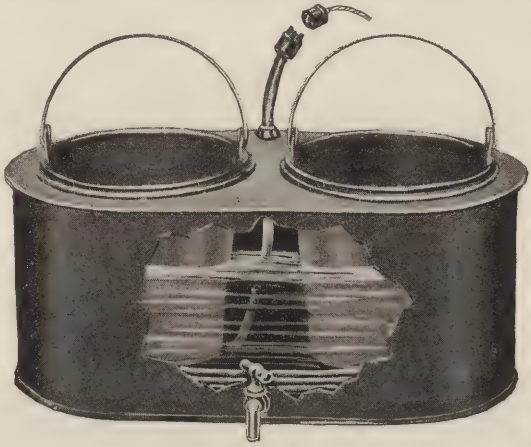
GLUE.

There is no other material which enters into the general production and contributes to the permanency of books of which there is as little known as glue. The sub-

Wetmore Water Jacket Air-tight Glue Heater (electric or steam heated), (Advance Machinery Co., Toledo.)

stance of glue is animal matter, such as bones, cuttings, hides, skins, sinew, feet, tails, snouts, ears and horn pith. Various parts of cattle, calves, goats, horses, sheep, pigs

and rabbits yield glue, having peculiar properties. Poor material in this, as in any business, will not yield a first-class product. The best material, if allowed to lie around, will decompose, and can only result in a low grade of glue. It is generally conceded that hide glue furnishes the best adhesive properties. Not infrequently is it expected that the cheapest glue will fill the requirements of the best. However, the average glue manufacturer sometimes receives complaints regarding the best glues. Investiga-



Wetmore Electric Glue Pots.
(Advance Machinery Co., Toledo.)

tion reveals the fact that eighty per cent of these complaints are due to the glue-melting pots not having been cleaned for months, or to the carelessness of the worker in permitting continuous boiling.

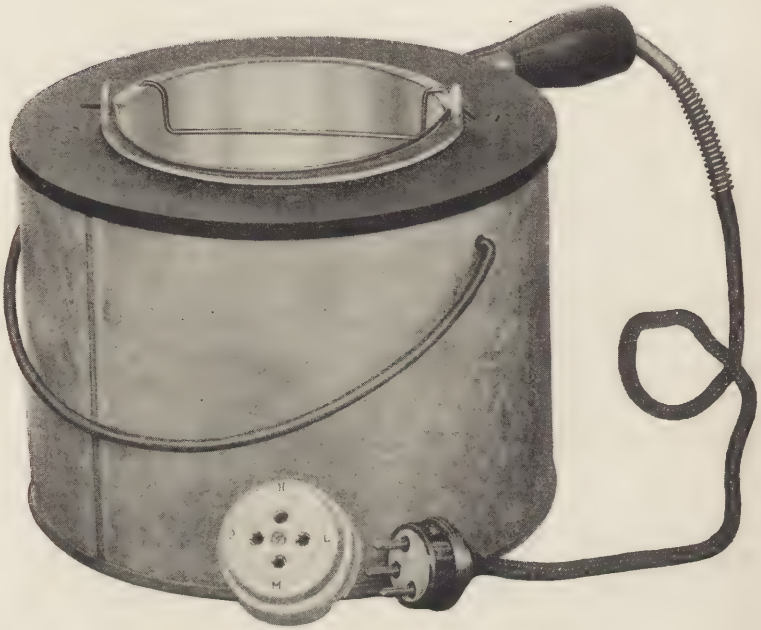
The glue tank with six pots and a large kettle in the center which is commonly used in bookbinderies ought to be condemned, as the constant evaporation causes the glue to thicken and "skin." Uniform heat can not be kept; and not infrequently the tank is allowed to boil over. The glue waste is enormous in proportion to the consumption.

The ideal cooker is one that has a water jacket and air-tight glue chamber. The glue is drawn into the indi-

vidual pots from a faucet. The water jacket is kept at a uniform heat by steam seepage through a siphon and the water level is automatic by means of a return pipe.

The glue is never boiled, does not thicken or skin, and can be kept for two weeks without material injury.

The ideal pot is the electric-heated copper pot set in a cast-iron water jacket. Deep glue pots are responsible



Gane Bros. Individual Electric Glue Pots.

for much waste of time in cleaning the hands and handle before using.

Glue is purchased in flakes, sheets, cakes, strips, ribbons, or in pulverized form. In soaking glue, it is necessary to immerse all in water, as protruding pieces require considerable heat to dissolve, and tend to spoil the glue. Ground glue must be soaked in the same manner and requires frequent stirring. The erroneous opinion pre-

vails that ground glue is an inferior article which contains sawdust and floor sweepings. Manufacturers can ill afford to sell an inferior article for first-class material.

Some large binderies heat the glue in a large vessel with direct steam, and the workmen have small pots which are filled from this. Direct steam is injurious to solution of glue; the drastic action of the steam weakens it. If the best glue is continuously boiled with direct steam for twenty-four hours, the gelatinizing power of the glue will be destroyed. Cheaper glues are destroyed in much less time. Glue boiled with direct steam for one hour loses a grade in strength, and a half grade if boiled in the regulation water tank at two hundred degrees for the same length of time. If the direct steam is employed, it is folly to boil the water until all is dissolved. Let the steam pass through the water in the tank in which the pots are set until the temperature is one hundred and eighty degrees, Fahrenheit. If no thermometer is at hand to measure the degree of heat, this may be approximately done by the cessation of the rattling noise produced by steam when passed under pressure into cold water, followed by a subdued rumbling. When this degree of heat is reached, stir the glue until dissolved.

If the glue has been properly softened, it will dissolve at a low temperature. Hot or warm water should not be poured on dry glue, as it actually retards softening. If the heating is done by gas or electricity, the pot must be surrounded with water and when the water comes to the boiling point the heat should be turned off.

Glue pots should not be set on a fire, as the glue will burn and char. All accumulations of skin on the top end of the pot should be removed before another melt is attempted. Thus the danger of souring glue is eliminated. Absolute cleanliness is necessary in handling any glue stock. The glue is first softened and melted in a large central kettle, the solution being made to produce a

stiff jelly. This mixture will require the minimum temperature to dissolve.

Glues which dry too quickly for certain work can be treated with small quantities of the following ingredients: glycerine, glucose, nitric or acetic acid.

Boracic acid added to a first-class quality of glue will cause it to stick to metal if the part be washed with benzine or muriatic acid before applying the glue.

GLASS, TIN, BRASS, STEEL OR OTHER METALS.—An adhesive that will stick on all of the above with absolute satisfaction: Mix equal quantities of fish glue (Le Page's) and ordinary flour paste and then add enough dammar varnish and turpentine — equal parts — to reduce the mixture to the consistency that is easily workable with a paste or glue brush.

The metal parts to be covered should be washed or wiped over with a cloth saturated with "household ammonia," which is diluted ammonia. For glass this is not necessary.

WATERPROOF GLUE.— To one pound of dissolved glue add one pound of glycerine. Rub up sufficient red lead into glycerine to produce a consistency of thick syrup, add one ounce to the glue and glycerine mixture, and apply warm.

Another formula frequently recommended is as follows: Dissolve sixty grains of sandarac in one pint of pure alcohol and oil of turpentine; dissolve one pint of glue and one pint of isinglass; pour these mixtures together until a paste is formed; this is strained through several layers of gray super and set aside — it must be warmed up before using.

Still another recipe is claimed to be the best, as it finds favor in shipbuilding: Dissolve one-half pound of india rubber in two gallons of turpentine or naphtha; then add an amount of shellac equal to the weight of the solution. Mix this thoroughly and stir frequently for a

few days. This can be warmed up before using, and will stick to metal or glass first washed with muriatic acid.

LIQUID GLUE.— Dissolve three pounds of glue in one quart of water; then stir into this gradually one ounce of nitric or acetic acid. This is always ready for use and possesses strong adhesive properties.

CEMENT.— Dissolve one ounce of isinglass in about five ounces of hot water; add one ounce of fifty per cent alcohol. Dissolve one and one-half ounces of gum ammoniac in three ounces of alcohol. Mix both solutions thoroughly and let stand over night.

A cement for celluloid is made by taking four ounces of shellac, six ounces of spirits of camphor, eight ounces of ninety per cent alcohol, and dissolving in a hot-water tank.

Celluloid edges may be joined together by moistening the edges with a preparation of alcohol and ether, and leaving under pressure over night.

GUM.—A gum which finds favor in gumming envelopes is made by dissolving one-half pound of gum arabic in water, and stirring in two pounds of glucose. When dissolved, add one-half pound of starch, and boil. This can be diluted with water as needed.

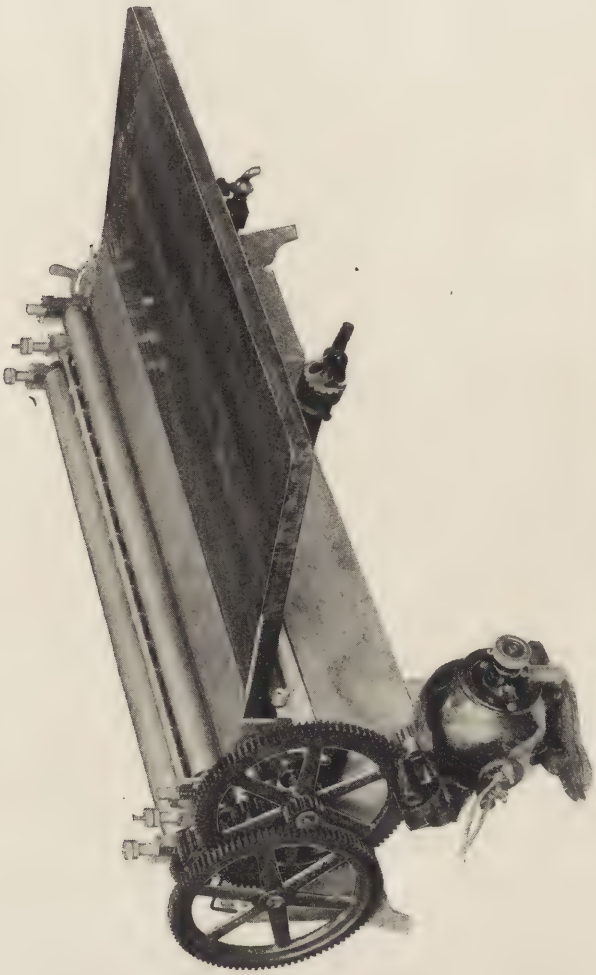
Dextrine can be substituted for gum arabic, but must not be boiled. Add boric acid to thicken and preserve it.

STICK GLUE.— Dissolve ordinary pale glue in water, then heat, and, when thoroughly dissolved, add 4 ounces of glucose. Then pour it on a glass or a marble slab, and, when cold, cut it up into convenient pieces.

Another formula which can be used for the same purpose consists of:

1 ounce of gum tragacanth.
2 ounces of glycerine.
6 ounces of gum arabic.
4 ounces of gelatine.

To this add a few drops of oil of wintergreen, or sassafras. Add one pint of water, and allow to dissolve.



Gané's Bench Gluing Machine. Operated by hand or power. Has automatic gas regulator to keep the glue at even temperature.

Then heat, pour on glass or marble slab, and cut up into pieces.

PREPARED GUM.— Dissolve one pound of gum arabic in three pints of cold water, add a tablespoonful of glycerine and two ounces of honey. Strain this and apply with a soft brush. If properly prepared this gum will dry flat. Curling of the paper or breaking of the gum is eliminated.

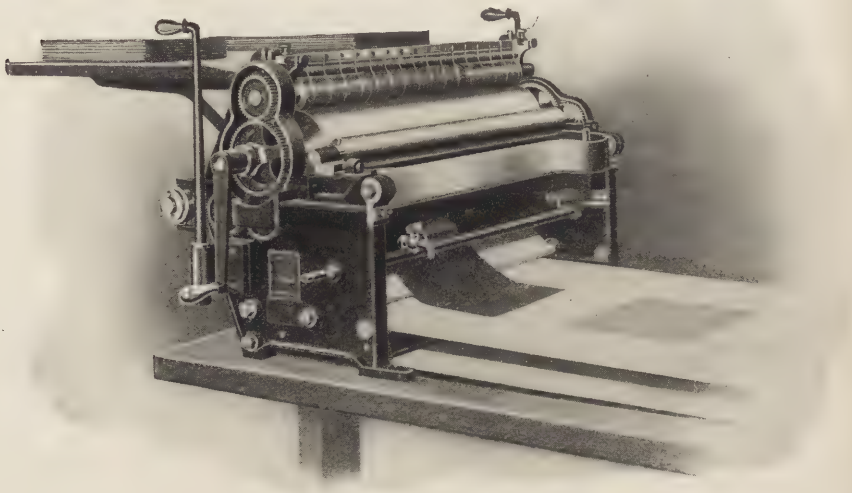
A strong gum is made by dissolving aluminum sulphate in water and adding a small portion to a solution of gum arabic.

PADDING COMPOSITION.— The ordinary glue is too hard for pads, and to make it flexible the following will be found to meet the requirements:

To one pound of glue add four ounces of glycerine, one and one-half ounces of glucose or one and one-half ounces of linseed oil, and one-tenth of an ounce of tannin. Dissolve in water and heat until melted. Any aniline or Diamond dye colors may be added as coloring matter. The flexibility of the composition can be increased by adding glucose and glycerine. Prepared composition can be purchased from bookbinders' supply houses.

GLUING AND PASTING MACHINE.— This machine is designed to glue and paste any kind of fabric, and delivers the stock wet side up onto a conveyor which travels from the feeding operator. They may be accurately adjusted to regulate the amount of adhesive desired on the material. The entire surface may be coated or any portion of it; hot or cold glue, paste, dextrine, mucilage, or similar material may be handled satisfactorily. The glue may be heated either with gas or electricity. Adjustable scrapers keep the roll free from all hard lumps of glue or paste, making it seldom necessary to wash the roll, and insuring the application of a fresh, clean coating of glue to each sheet. The conveyor passes along the top of the forwarding table and in a convenient position for the removal of the glued or pasted sheets. The speed of the

machine is sufficient to keep from twelve to twenty forwarders busy with one feeding in the fabric. A saving in adhesive material is effected, as there is no waste. On some machines, boards may be glued or pasted.



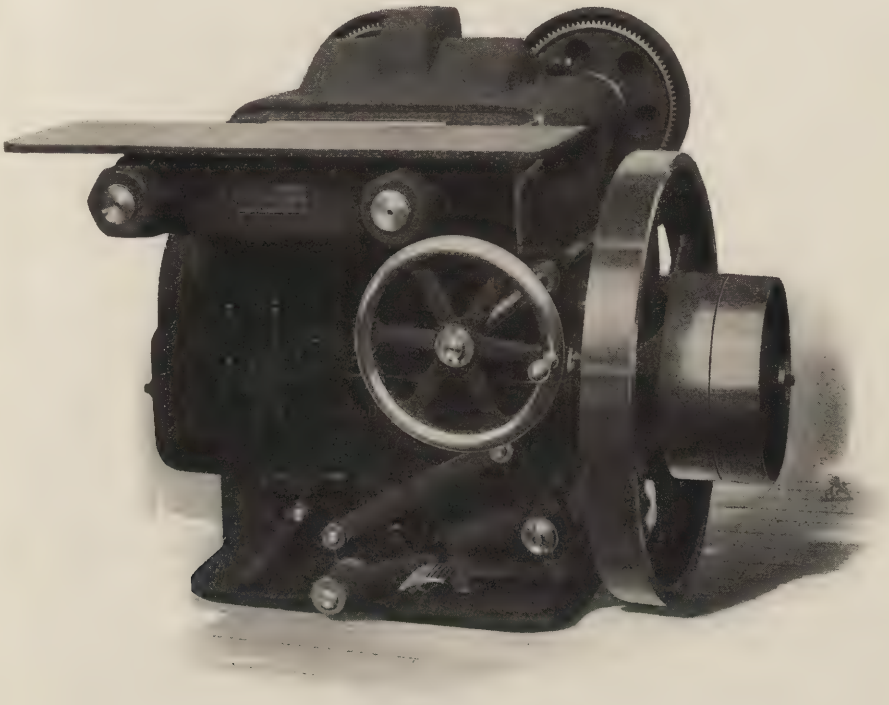
Smyth Gluing and Gumming Machine.
E. C. Fuller.

REDUCING SEWING SWELL.

Sewed books are often too thick for compact binding, and the backs should be reduced before trimming. This is accomplished by taking one or more books and placing

them between two binders' boards, jogging the back and head, securely holding the fore end in the left hand, and hitting the back with a ten-pound beating hammer. Care must be exercised, as the signatures are apt to sag and break the thread. Binders possessing an old hand clamp

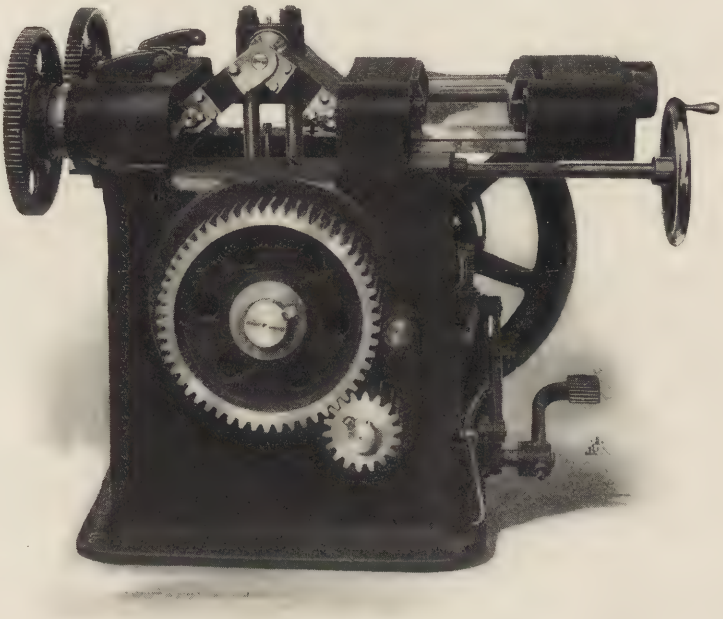
cutting machine can utilize it to good advantage by putting the fore end of the book under the clamp and tightening it. This will, in a measure, prevent sagging, and the beating is greatly facilitated. After the books are beaten, stretch the tape or twine so as to produce an even appearance on the back.



Front View Seybold Book Compressor.

BOOK COMPRESSOR.— The sewing swell at the back of books was the terror of ancient binders, and the beating hammer was a useful tool to reduce the bulk. The beating operation was responsible for the resewing of many volumes, as the signatures would sag and the thread break. The invention of the compressor a few years ago

relegated the beating hammer to the background and added considerable to the production of the trimming and backing machines. This machine is compact, powerful, and pressure is obtained by the straightening of a heavy set of toggles through two heavy steel bars, actuated by a crank shaft. A slow, uniform pressure is obtained, and the book remains in compressed form after the jaws are released. The jaws are set to a gauge by means of a hand wheel, according to the thickness of the books. It is easily



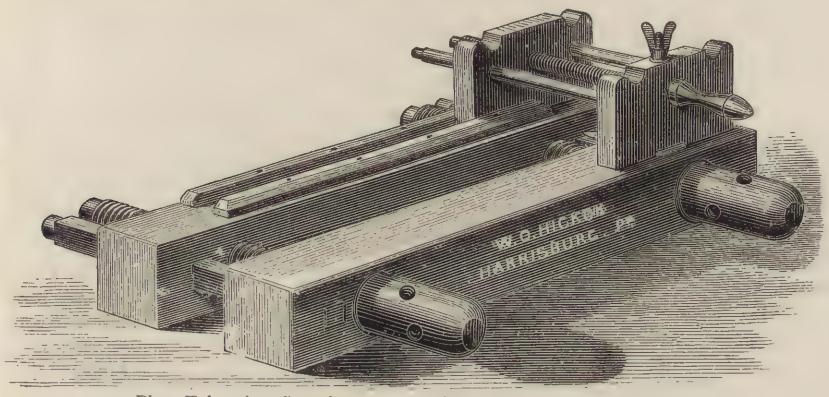
Seybold Book Compressor Stripped, Showing Toggles and Gearing.

adjusted, and is built in five sizes, which will take any length of book up to thirty-six inches. It consists of two upper and two lower jaws. The jaws slide in two horizontal bars; the upper jaws hold the book in place before the lower jaws close in on the back. This prevents sagging or disarranging of signatures before or while under

pressure, and the uniformity of the back is a great help to good rounding, backing and casing-in.

TRIMMING.

A common error made by printers is to make up forms the full measurement of the page, thereby leaving the binder no trim margin. A standing rule of every printing and binding establishment should be to allow one-eighth of an inch trim margin for the fore edge, head and tail of all stitched tablets and quarter-bound cut-flush books. All sewed books should have three-sixteenths of an inch for the fore edge, and one-eighth of an inch for the head and tail trim margins. The trimming of letter-



Plow Trimming Contrivance, for Fine and Amateur Job Binding.

press work should be standardized, so that paper-covered books are trimmed a trifle larger to permit a retrim when books are returned for a substantial cover. To illustrate this, a sheet 24 by 38 inches made up into thirty-two-page signatures, when folded, is 6 by 9½ inches. The paper-covered books should be trimmed 5⅞ by 9⅛ inches; one-eighth of an inch is trimmed off the head, the balance off the tail, while the fore edge has one-eighth of an inch trim. These books, when returned for permanent covers, as they frequently are, have one-sixteenth of an inch

trimmed off the head and tail, and one-eighth of an inch off the fore edge. This gives the standard book size, 5¾ by 9 inches, for the bound volume.

When the entire edition is to be bound with a permanent cover, provision is made for three-sixteenths of

an inch trim at the head. This enables the printer to standardize forms without varying the head margins, and gives the binder sufficient margin to trim in accurately-folded sheets.

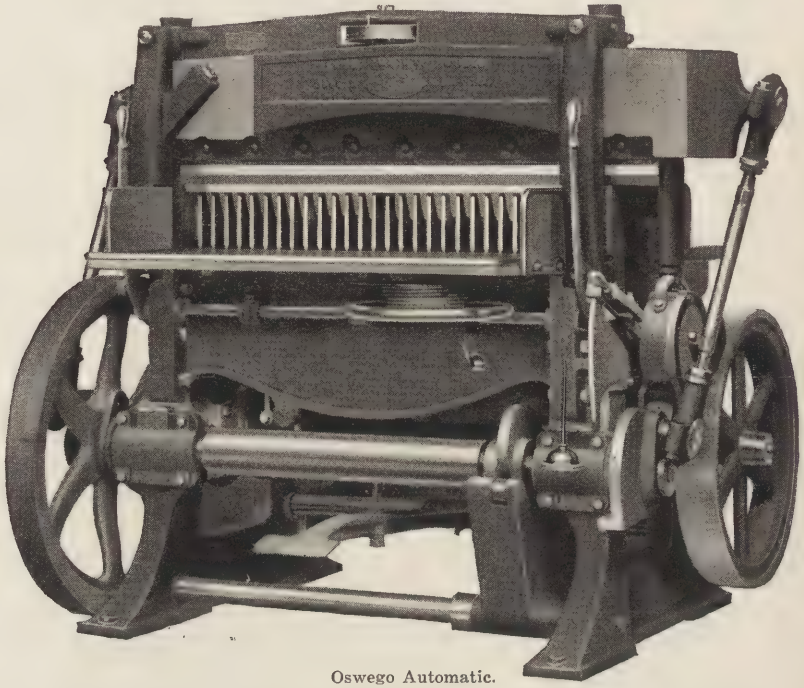
To trim books on a cutting machine, take as many as will make about three inches, and jog at the head and back. Set the back gauge the exact size to which the book is to be trimmed; put the books in the machine with the head against the side and the back against the back gauge. Run down the clamp, provided the machine has a hand clamp; an automatic or self-clamp requires nothing more than to pull the lever. When the machine stops, remove the books and put to one side. Repeat this operation until all books are trimmed on the fore edge and lay aside in piles with the backs out.

To trim the heads and tails, fillers must be made to take up the thickness of the back. Cut strips of straw or binders' board about four inches wide; glue them together; fan out and press. Put the books in the machine with the heads against the back gauge and the trimmed fore edges against the side; then lay the board filler on top in such a way that the fanned-out ends are sufficiently away from the back to permit an even pressure of the clamp on the books. Pull the lever, and repeat the operation for subsequent books. The filler can be glued to the clamp, and the books put directly under it.

For the head, the split gauge is set forward, and the trimmed tail end is placed against the back and side on the other end of the machine. The board filler is placed on top in the same manner as above described, and the operation continued. On thin books the board filler may be dispensed with by reversing and alternating the backs so as to distribute the swell on both ends.

If there be two splits in the back gauge, set the center for the fore edge, the left for the tail, and the right end for the head. This, however, should be done only when the quantity to be trimmed justifies it. When the back

gauge is set, tighten the set-screw with the hand. Wrenches were not made to use on thumb-screws, hence should not be used for this purpose. To guard against the depression across the end by the pressure of the clamp, cut a piece of binders' board somewhat longer than the width of the clamp, and glue it on.



Oswego Automatic.

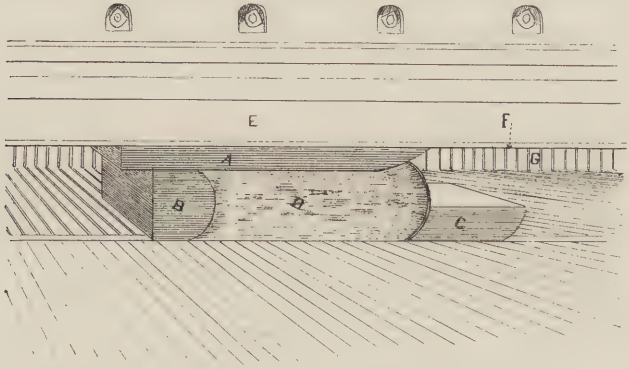
Waste leaves should be placed on the top and bottom of all enameled or glazed stock to keep it clean.

To trim quarter-bound cut-flush tablets or pads which are bound two or more on a sheet, as in the case of receipts, trim the fore edges, cut all the tails alike, then the heads. The knife should cut against the back. In making-up books to be bound two or more on, one-fourth of an inch trim must be provided for, to clear the bevel caused by the knife. This is provided for if books are

made up with one-eighth of an inch trim for the head and tail. Thick books can be bound two or more on until the stitching is completed. Then cut apart and proceed with the rest of the binding in the regular way.

Blank-books are trimmed so that the standard sizes are reduced one-fourth of an inch for the length, and three-sixteenths of an inch for the width. The paper for a medium book is 18 by 23 inches; when folded, 11½ by 18 inches. The length trim size is seventeen and three-fourths inches, while the width is eleven and five-sixteenths inches. If such standard sizes are adopted, the work of forwarding is greatly facilitated, as cases and boards can be made in advance without fear of the books being trimmed too large.

In trimming spring-back account-books, sewed straight or on guards, the fore ends are trimmed, then forwarded until the books are in straps. Sharp knives

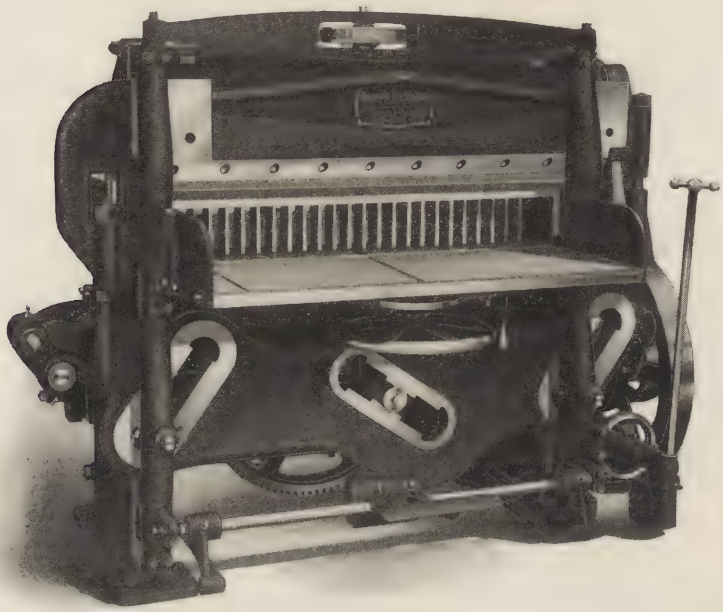


A — Board filler. B — Paper filler. C — Paper filler. D — Book. E — Knife. F — Clamp. G — Gauge.

are indispensable in trimming books which are concave on the fore edge. Deep rounds should be filled in with waste paper to prevent the top sections and the back from breaking. Board fillers are always laid on top and the book placed so that the knife will cut against the back.

AUTOMATIC CLAMP CUTTER.— These cutters have a self-clamping arrangement which is independent of the

knife, and which can be adjusted to vary the pressure on the pile. Any size pile or weight of paper may be clamped securely with an even pressure. The descent of the clamp is gentle, and it packs the stock without jarring the sheets out of position, and maintains an even pressure during the stroke of the knife. A positive throw-out is provided to stop the machine after every cut. The indicator wheel for the back gauge is a great help for rapid adjusting of

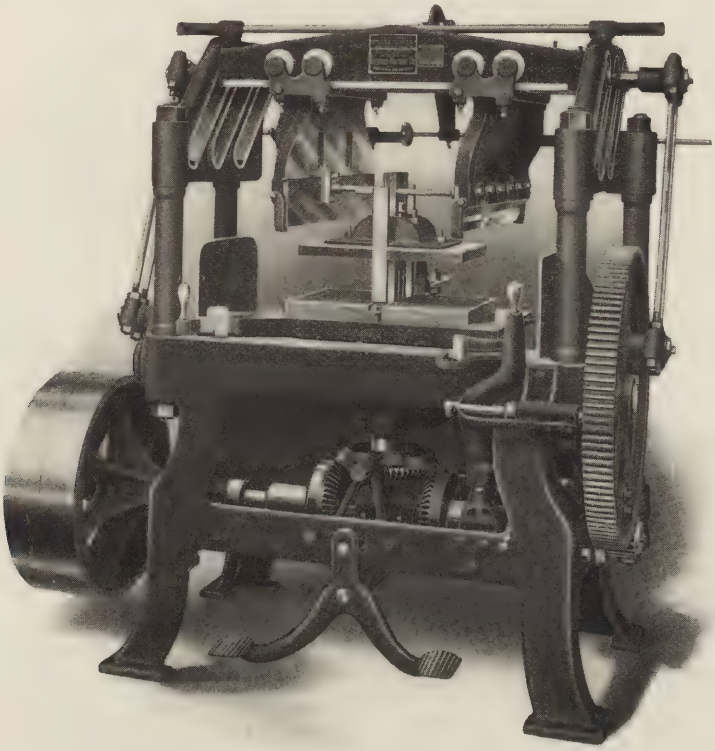


Seybold 20th Century.

the gauge, and reads its position to the sixteenth of an inch. Micrometers may be attached which will read to six-thousandths of an inch. The treadle may be held down upon the pile after the cut has been made, so as to prevent narrow, unstable piles from falling over. The side gauges are flush with the frames on each side, front

and back. The knives are easily removed for sharpening, and the adjustments are simple.

DUPLEX BOOK TRIMMER.— The unique feature of this machine is that instead of one knife, requiring four turns of the piles, it is built with two parallel knives, requiring



Seybold Duplex Trimmer.

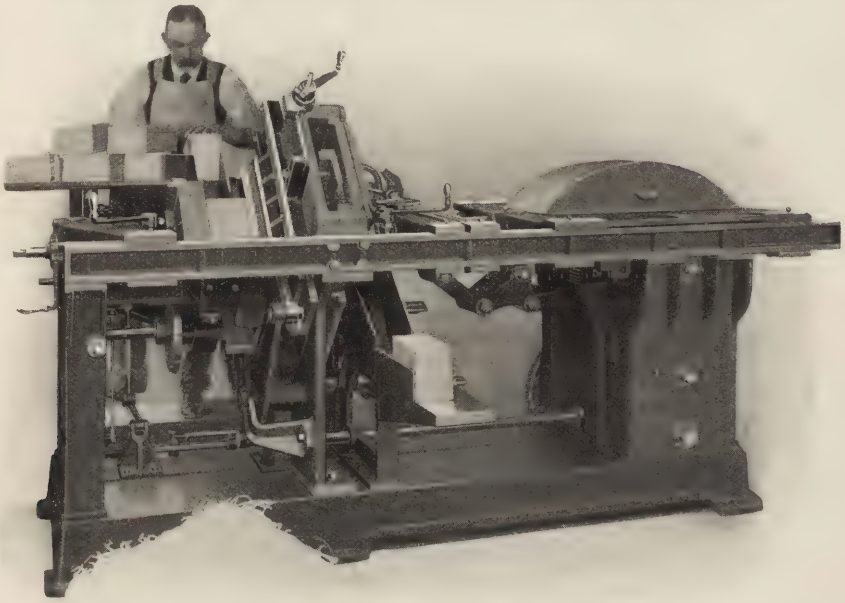
only one turn of the table to trim four edges. Two piles of all sizes from 2½ by 5 inches to 12 by 16 inches each, and six inches high, are automatically clamped, cut and unclamped. The double knives, obviating any twist, produce exact results. The only adjustments are lowering the knives to take up wear from grinding, setting two

collars to govern the knife-bar movement according to the size of the piles, and setting the back gauge.

A number of different sizes of pattern blocks to correspond to the trimmed sizes of books are required. To trim books, adjust the pattern blocks in the machine to the clamping mechanism, set the collars to govern the knife-bar movement according to the size of the piles, and set the back gauge. Two piles of books are placed back to back on a movable table, which exposes to view the four edges which are to be trimmed. By pulling the lever the mechanism is set in motion, the piles clamped, and the knives then descend and trim the fore edges. The other untrimmed edges are brought under the knives by giving the table a quarter turn, which brings the knives into correct position for the head and tail trim. The books are then released from the clamp pressure and removed.

AUTOMATIC BOOK TRIMMER.— This machine is designed to trim books and magazines on three sides at one operation. It will trim all sizes of books within the range of the machine — from 4 by 6 inches to 8½ by 11½ inches, and from one-fourth of an inch to four inches in thickness. The change from one size to another and from one set of knives to another is simple and quickly made. There are no cutting sticks, and the knives cut against uncut work only, which obviates the necessity of using the shears when cutting sticks become worn. The operator, at proper intervals, feeds a handful of books, three or four inches thick, to the gate, which releases itself, and the books drop into a work holder, which supports the books at an angle of forty-five degrees. Thus the books are jogged without assistance from the operator. The work is subjected to a pressure of from three to four thousand pounds, and then moved to the rear, about seven inches, against the three knives, which are carried by a stationary trimming plate. There is a shear motion on all three knives equal to the travel of the bench of books, which takes place while the bench travels and the

knives cut. The plungers then unclamp and retire from the rear end of the bench; a handful of books is discharged into the receiving trough; the gate is released; a new handful of untrimmed books is dropped into the place, and the operation is repeated. As the books are clamped and unclamped several times in order to dis-

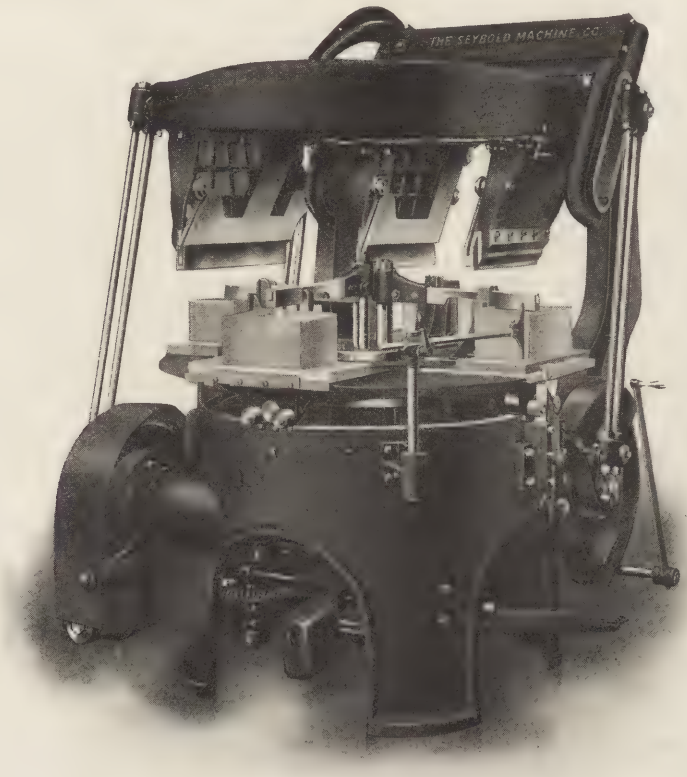


Smyth Automatic Book Trimmer.
E. C. Fuller.

charge handfuls of work, they are thoroughly smashed and uniform in thickness.

This machine requires one operator and two helpers — the one to place books on the feed table, and the other to take the books from the receiving trough and stack them on a truck. The operator can readily feed from twelve to fifteen handfuls of books per minute, which means from two thousand to twenty-five hundred books one inch thick per hour. From four thousand to six thousand magazines one-half of an inch in thickness can be trimmed per hour.

CONTINUOUS TRIMMER.— This machine is capable of delivering six hundred piles six inches high per hour. It will trim sizes as small as 3½ by 6 inches and as large as 13½ by 18 inches. The changes from one size to another are very simple, and consist of turning the cranks that regulate the space between the head and tail knives, and shifting the four back gauges. There are three knives



Seybold Continuous Trimmer.

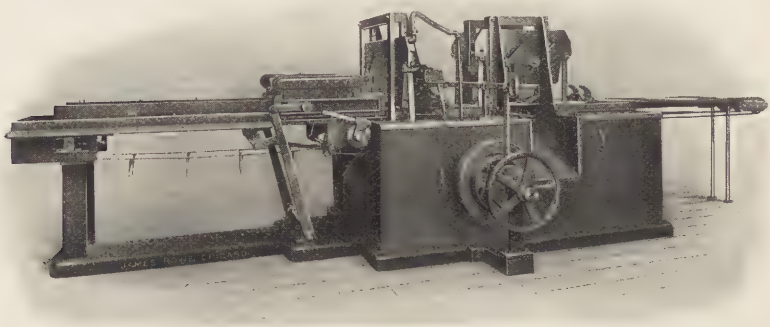
provided with automatic clamps and a revolving table which carries the books under the knives. When the heads and tails of one pile are being trimmed, the fore edges of

the other pile are also trimmed. The operation is continuous after three piles of books have been put into the machine, as the table makes one-quarter revolution at each movement.

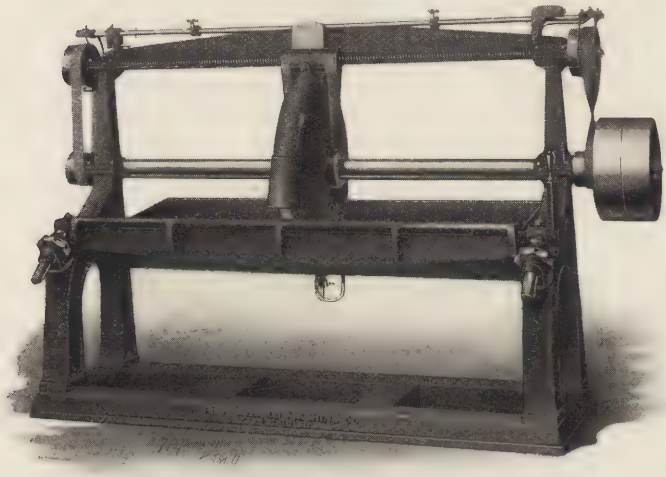
In placing the books in the machine, one pile of books or pamphlets is handled at a time in front, three feet away from the nearest knife. This leaves both hands free to hold the pile in position, while with the foot the clamping pressure is applied to hold it until the final pressure is applied by the automatic clamp which each knife carries with it. The clamp accommodates itself to any swell in the back of the books or pamphlets. The pile is held firmly against the back and head gauges while the first pressure is being applied. As soon as the pile is put in position and the foot clamp is brought down upon it, another pile is prepared in the machine. While so doing, the table has revolved a quarter turn, carrying the pile previously placed into position between the knives that trim to the head and tail. By the time a second pile is prepared, the table has come to a stop; and while the knives are cutting the first pile, the second pile is placed in position. After the head and tail cuts are made, the table makes another quarter turn, carrying the first pile to the opposite side of the machine to the operator.

The table is brought into proper position when it stops by means of a wedge that lifts it between two rollers which carry it to exactly the same position at every stroke of the knife, so that variation is impossible. The action of the shear movement knives cutting at both ends at the same time is toward the back gauge, against which the backs of the books or pamphlets rest. All three knives are stationary and carried by immense, heavy stocks, all of which are attached to a head or platen of great strength to insure rigidity without trembling or vibrating. The knives are in constant operation with a slow, steady movement, and are pulled down by three sets of steel rods. A number of small cutting sticks laid

parallel, locked in by means of quoins so that each stick may be turned separately and shifted, obtains many cutting surfaces on one set of sticks.



Rowe Straight-line Automatic Book Trimmer.
(Capacity 24 packages of 4½ or less in. thickness per minute.)



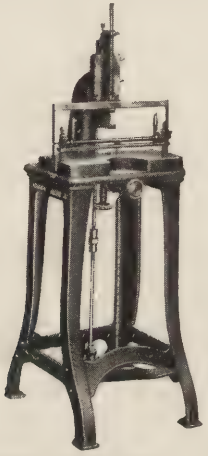
Seybold Automatic Knife-grinder.

BALING PRESS.— The baling device may or may not be run by power attachment. It is a press to compress large quantities of waste paper into large bales. The machine is provided with channels for baling wire, pressure is

applied by turning a handle, and, when the hopper has been filled to its full capacity, the wires are fastened and the bale released. The waste is deposited daily into the press, and, when a number of bales have accumulated, they may be sold to the nearest paper-mill. Not only are cash returns thus brought in, but there is a saving of insurance, as well as the gain in space and tidiness.

ROUND-CORNER CUTTER.

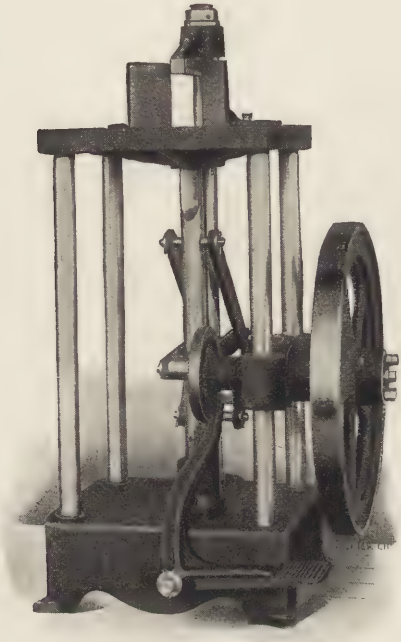
The shafts and toggles of this machine are of steel, solidly built. A clamp holds the paper securely. The fly-wheel devices operate the pulley and rotate an inner disk.



Latham Combination Round-corner and Index Cutter.

To this the steel toggles are fastened and so adjusted that they pull the clamp down to the paper and on to one sheet or to a pile four and one-half inches high. As soon as the clamp has a firm grip upon the pile, it stops. The knife, beginning to rise, is pushed upward until it meets the cutting face on the lower part of the clamp, so that, while the cutting is done, the clamp and knife pull against each other, and the cut is clean and perfect. The clamp

may be raised or lowered by upper and lower set-nuts. The table gauges are adjustable in any direction. The wooden cutting stick may be removed when worn out. These machines have three forms of knives. The size of the table is 16 by 20 inches.



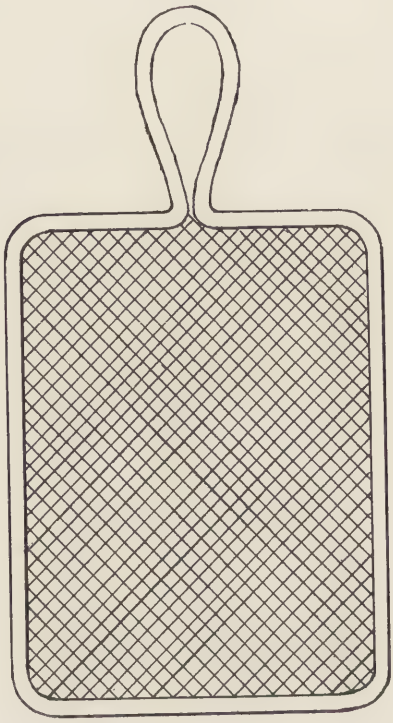
Seybold Power Round-corner Cutter.

DECORATION OF BOOK EDGES

COLORED EDGES.— Sharp knives are indispensable in trimming books which are to be decorated. A nick in the knife ruins the edge, no matter with what labor the decoration is accomplished. The color to be applied is left to individual taste, but some effort should be made to harmonize the coloring with the book covering. No fixed rule can be laid down, and the forwarder should devote some time to the study of color harmony. The mixing of colors is confined to the wholesaler, and any combination of colors can be purchased from any first-class supply house. Aniline colors or Diamond dyes can be used with good results.

After the books are trimmed, place as many as can be jogged between two boards, jog carefully on the fore edges, put a board on top, and apply a thin coat of coloring with a brush held in the right hand, while the books are held firmly with the left. The ends are treated in the same manner. If the books are small, the coloring may be commenced at the head, then the fore edge and tail. When dry, rub the edges with a waxed rag to brighten up the color. On cheap paper the color will run into the leaves; to remedy this, mix it with a little gum arabic, apply a coat of alum water to the edges, and when dry apply the coloring. To color books when rounded, place them between boards and apply the color by holding the brush perpendicularly — first to the bottom half, then turning the hand and applying to the top half. If the brush is held horizontally, the color will run into the leaves, especially on the fore edge and back, where the sections or signatures have been started by rounding. All spring-back blank-books should be colored after the book is in straps.

SPOT EDGES.— Many binders prefer a spot edge which, if the color harmonizes, produces a well-appearing book. To do this, put as many books in a backing machine or hand press as it will hold, and sprinkle sand, rice or sawdust on the edge lightly. Prepare the color with a little gum arabic and a few drops of oil; then dip a soft, stubby brush into it, and rub gently on a sieve made of one-



quarter mesh. This operation may be repeated with any number of colors, or may be done in the same manner on plain-colored edges. An atomizer purchased in drug stores, when filled with color, gives better and quicker results for spraying or sprinkling.

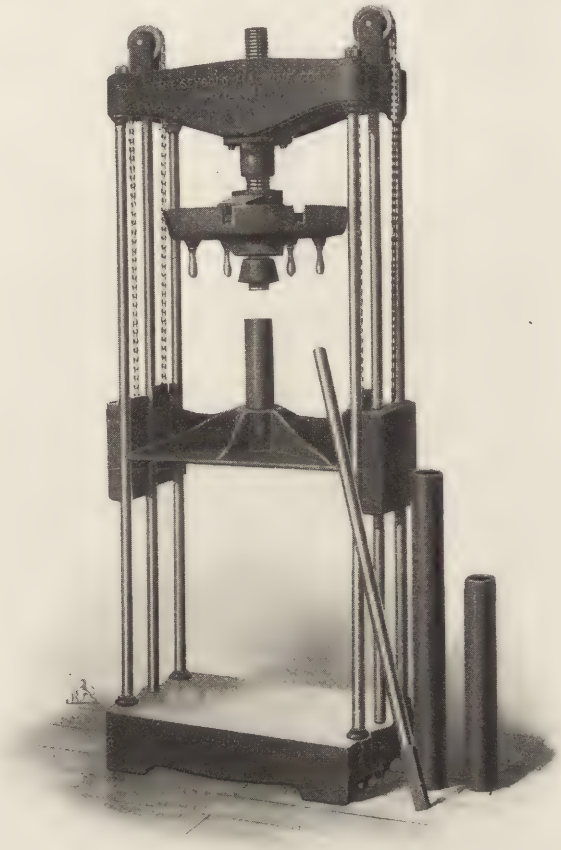
STARCH EDGES.— The beauty of starch edges is only excelled by marbling, and here, as in marbling, the judicious use and harmony of colors is essential. To produce this edge, prepare the books as described under the preceding head, and mix a small quantity of rice starch with water until it is of the consistency of paste. To this add aniline colors, and mix thoroughly. Throw on these colors with a whisk broom, and endeavor to obtain an even spatter. Repeat this operation with the second and third colors; then, if desired, another color may be sprinkled on with the brush and sieve. This last color must be prepared as described under "spot edges." When dry, bend the book up and down and the starch will fall off, leaving the color effect on the edge.

WAX EDGES.— Many job shops and blank-book houses, because of the scarcity of marblers, embellish the edges with other fanciful patterns. Wax produces the spots, while a solid color is applied with the brush. To do this, place the books between boards and in a backing machine or laying press. Melt together beeswax and tallow. Insert a whisk broom into the hot mixture, and beat it on a stick carefully to get an even spatter. With a brush the color is applied, and when dry the leaves are bent up and down to remove the wax. Rub a waxed rag over the edge briskly to brighten it. All books which are to have wax edges must not be rounded until the fore edge is finished. The irregular spots produced by the wax enhance the appearance of the books.

An imitation wax edge is produced with a perforated composition roller. This reduces the time considerably, and can be recommended to fill the requirements.

TRANSFER EDGE.— Marble paper may be transferred to book edges in the following manner: Place the book in a press between boards. Cut a piece of marble paper a trifle larger than the edge; then lay it in a flat pan containing muriatic acid. Sponge the edge with alum water; place the paper on the edge, and lay five or six strips of

blotting paper on top. With a hammer, tap lightly until the edge is transferred; then remove the paper, and, when dry, rub a waxed rag over the edge, or burnish.



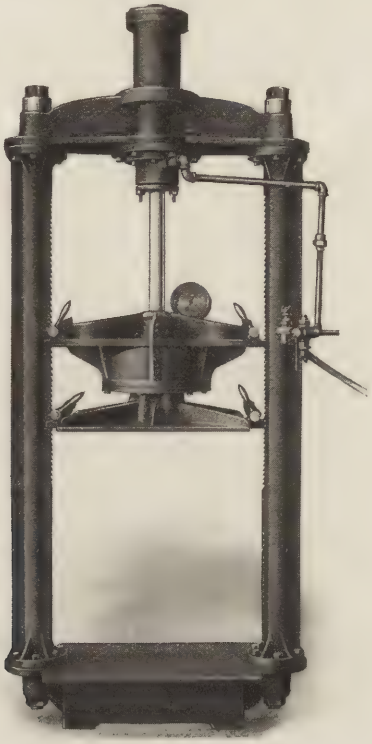
Seybold Standing Press.

PRESSING.

For this operation there are many different styles of presses, from the simple wooden to the complex hydraulic. The one in use in the majority of establishments is the

plain four-rod press. Because of the constant necessity of blocking, a much improved press is now on the market.

With this press, pressure may be instantly applied to any size pile. This does away with the old, laborious method of blocking. The platen, detached from the screw, is suspended by two steel chains, passing over pulleys on

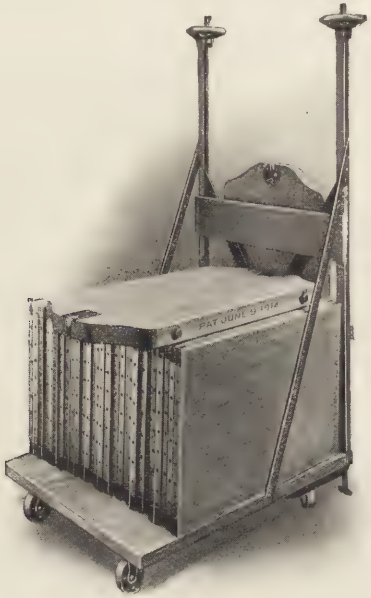


Berry Pneumatic Standing Press.

top, on which are hung two counter-weights outside the upright rods. By this means the platen may be instantly raised or lowered and brought directly on the pile to be pressed. The equipment of each machine includes steel tubing of various lengths to fill the space between the platen and the screw. Final pressure is applied with a

bar, fitting into a hinged socket and dropping into one of the notches of the revolving disc. After being swung around, the bar, without removal from the socket, is lifted into the next notch.

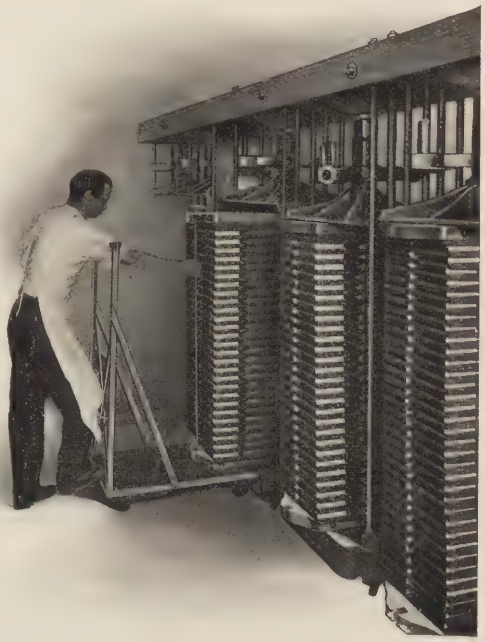
For heavy and rapid work, compressed air does all the work. Operated by means of small lever seen on the side of the illustration on the preceding page.



Standard Removable Press Equipment.
(Pat. June 9, 1914. Tapley Specialty Co., New York.)

STANDARD PRESS EQUIPMENT.— The average bindery is frequently confronted with the problem of insufficient pressing devices. Very often all the presses are filled, and this, too, at a time when one is urgently needed. The length of time that the books are required to remain in the press is responsible for the many presses in most establishments. The Standard Press Equipment consists of a top and bottom board, with grooves on the ends in which iron rods are inserted and held together by means

of hand wheels. The pile is then pulled out on a small truck, and stored in a convenient place. This method is far cheaper than the purchase of additional presses, and saves floor space.



Showing the Press Equipment in use.

ROUNDING.

The object in rounding a book is to enhance the appearance and counteract the drawing of the signatures toward the fore edge. A flat back will become concave when opened and closed a number of times. The first step in the process is the fraying out of the cords on all books thus sewn, and then gluing the back. A hard, brittle glue will crack, and will break the kettle-stitch in rounding. The best flexible glue should only be used, as on the gluing of the backs of the signatures depends the entire strength of subsequent operations. Thick glue can not be rubbed

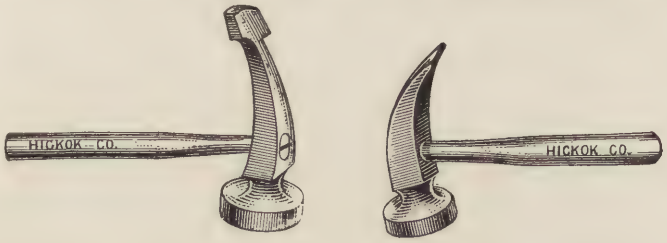
between the signatures or sections, and leave a sufficient amount to hold them together. Thin glue will penetrate the signature or section through the holes made by the sewing machine punches or needles. All glue for this purpose should be about the consistency of cream, and be applied to the back with a short, stubby brush. To protect the bench when gluing the backs, cut a piece of zinc twenty-four inches long and sixteen inches wide; bend it in the center; this is then laid on the edge of the bench, leaving eight inches on top and eight inches to hang over. The backs of letterpress and blank books are glued after the edge is put on; then rounded. All books are then marbled at the head and tail. The operation follows:

Jog trimmed books carefully, and pile upon the zinc. Lay a piece of binders' board on the top, and hold the pile tight with the left hand. With the right hand apply the glue liberally; then rub in between the signatures or sections. Considerable elbow grease should be expended to produce the required results. The surplus glue is then taken off the books with the brush. They are jogged, and separated by alternating them with the backs out. Glue on the surface furnishes no strength, and, unless it is strenuously rubbed between the sections with a stubby brush, the operation will defeat the intended purpose.

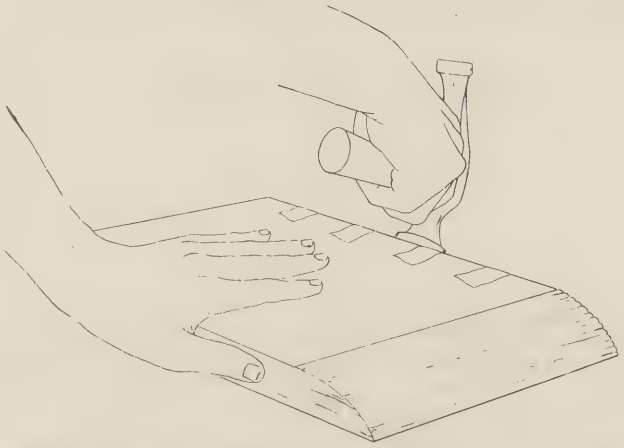
Care must be taken to keep the cord ends free from glue, or it will be difficult to lace them into the boards. On special work, slit the bolt of the waste leaf near the cords, and insert the cords between the waste and the end-leaf. This will protect them from being glued.

The book should be rounded while the glue is still plastic, as otherwise the sections are easily started. If the glue has been allowed to become hard, moisten the back with hot water. The hand operation is done with a hammer as shown in the illustration. Take the book and lay in front, the fingers of the left hand on top, and the thumb on the bottom or fore edge. Draw the book by pressing the fingers and thumb together; the back is

drawn toward the operator at an angle; then hit the back gently. On hand-sewed books the hitting must be confined to the center, as the kettle-stitch is easily cut if it has been sewn too tightly and not reinforced. Then turn the book over, and pull over the other half with the left hand, the thumb on the fore edges, and tap gently on the



back. This may be repeated once or twice, but each time the round must be worked in with the bended index finger and thumb of the right hand before tapping the back. To hit the book on the first and last signatures of the book



forces them over, and makes it impossible to obtain a perfect ridge in backing. A perfect round is about one-third of a circle. In edition shops, the rounding of a book is accomplished with not more than eight taps of the hammer. Every move is made to count.

Blank-book rounding is more difficult, and whip-stitched books still more. On the whole, the same method as above described is employed for all books.

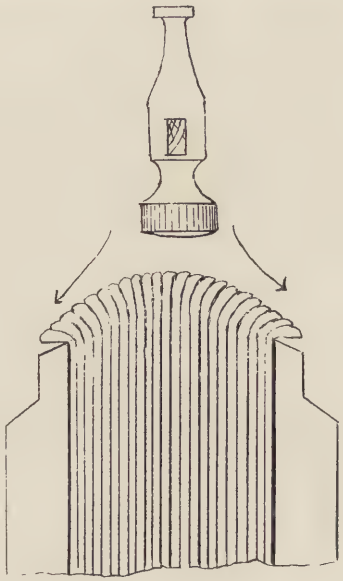
MACHINE ROUNDING.— Books rounded with machines are treated in the same manner as described for the hand operation. The table is adjusted to the required height, and the book held against a convex form, which brings the signatures of one-half of the book forward; the book is turned over, and the operation is repeated. This is much more accurate and is more quickly done than hand rounding.

BACKING.

All letterpress books should be backed to even up the thickness of the board with the back and permit a freer

Job Backing Machine.

opening of the book. This is done by putting the book in the backing machine with the cords, tape, and the back above the jaws. The width of the back above the jaws is governed by the thickness of the board to be used, but ordinarily not more than one-eighth of an inch is required. The round must be perfect before screwing up the machine. The swell caused by the sewing may easily be



brought over to the right and left by lightly tapping the back with a hammer from the center to the sides. Do not hit hard on the kettle-stitch nor flat on the back, as the thread may break and dents appear; always tap at a slant to the sides to form the ridge. The ridge thus formed should be at an angle, so that in setting the board close to it in the subsequent operation, all parts will be even. When opening the book, the signatures should be free from wrinkles, as their presence indicates poor workmanship. Flexible or limp-bound books need not be backed; still some binders prefer to back all letterpress

books, claiming that it facilitates the opening. If such books are backed, the ridge should be very small, as otherwise it would be bulky.

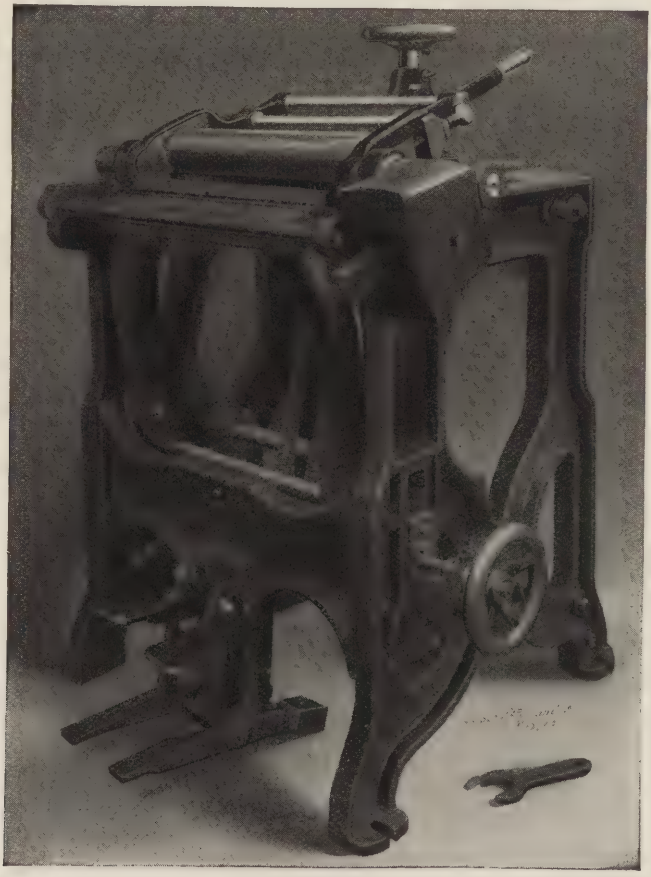
The combination backing machine and press is a most useful article in any bindery, as it is easily convertible

Seybold Convertible Job Backer and Press.

from its horizontal position as a job backer to a vertical position as a small standing press. The jaws are twenty-four inches wide, and the construction is rigid and compact.

ROLLER BACKING MACHINE.—A more expeditious backing method is that done with a roller backer. The jaws of the machine are adjusted to the thickness of the book by the hand wheel on top, back of the roller. The roller is adjusted by a hand wheel on the right of the

machine; it is raised or lowered by two nuts, operating on screws on both sides. These are raised or lowered, according to the height of the book. Accurate rounding is indispensable when backing with this machine. When adjusted, put the book in the machine as described in the preceding chapter, and clamp tight by stepping on the first treadle; then step on the second treadle, and bring

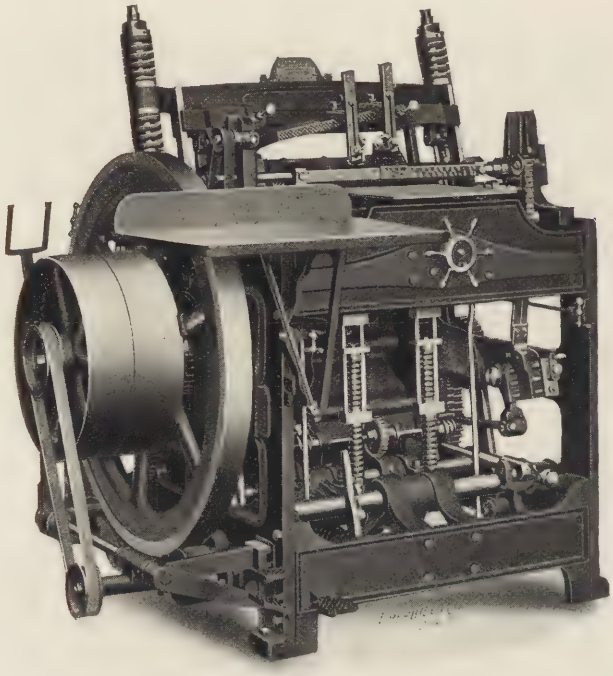


Roller Backing Machine.

the roller forward and back two or three times. Release the clamp by stepping on the treadle, and remove the book.

ROUNDING AND BACKING MACHINE (CROWLEY).

The production of letterpress books by machine had its beginning with the invention of the rounding and backing machine. The laborious hand or roller backing

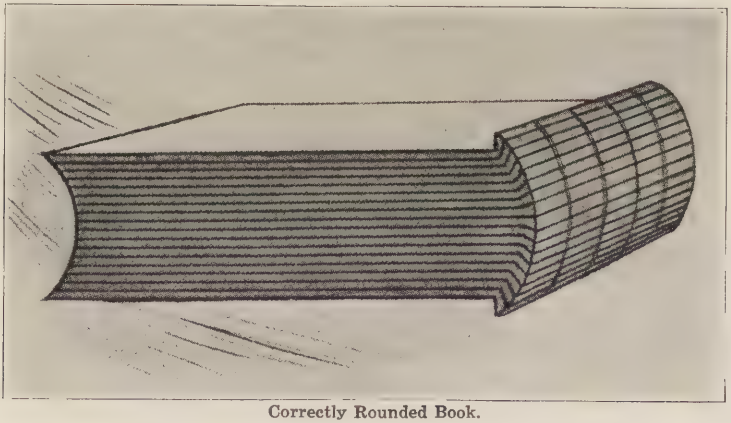


was thus eliminated. After the backs of the books have been glued up as described under " Rounding," the books are fed into the machine between a pair of rollers, the back resting against the guides, which must be accurately set. The upper roller descends on the book, the guides rise up out of the way, and the rollers rotate sufficiently

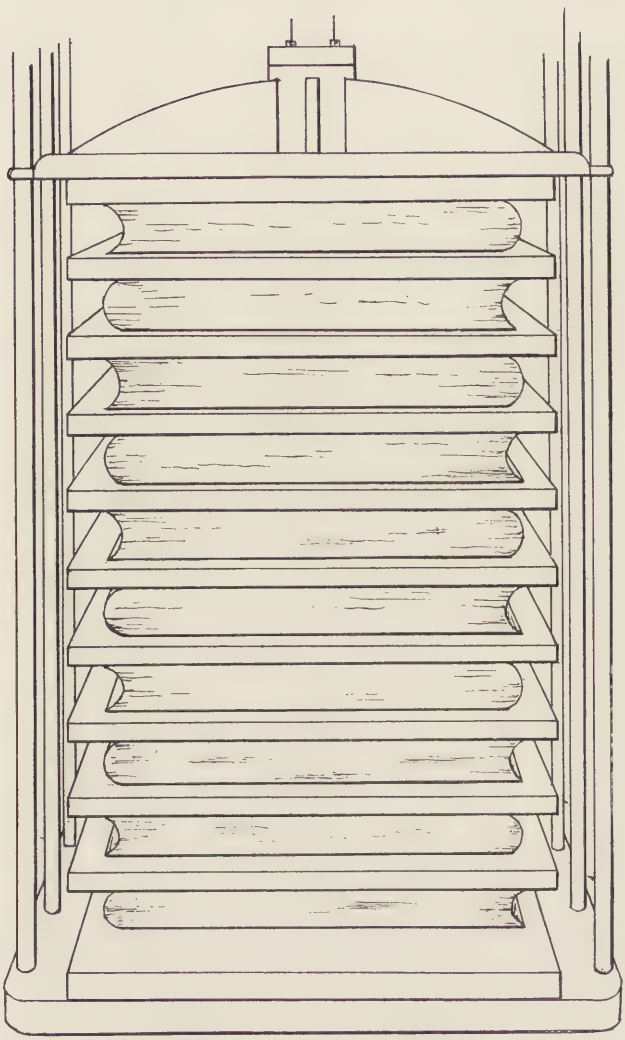
to round the back and advance the book between a pair of jaws which clamp it firmly and bring it in contact with an oscillating concave form. The former first touches the back of the book in the center; then, with several movements, pushes the signatures to the sides to form the ridges — this is done without meshing or straining the sewing. When the back has been formed, the book is carried to the operator by the jaws, which release their grip. Before the book is taken out, another book is fed in between the rollers to the guides which in this movement push the former book out to grasp the one fed in. The return of the book to the operator prevents any possible injury, and admits of inspection without loss of time.

The adjustments are made for the rounding, the clamping, and the backing. Thin and thick books are backed equally well. The book can be rounded without backing, or backed without rounding. The backing plate should always be one-fourth of an inch wider than the thickness of the book. If the books are rounded, the backing plate is not fastened in the machine.

This machine can be had in three sizes: the small size will take books three inches to ten inches wide, two and one-half inches to twelve and three-fourths inches high



Correctly Rounded Book.



Blank-books in Press After Rounding.

or long, and one-eighth to one and three-fourths inches thick, at a fast speed of fourteen or a slow speed of nine books per minute; the standard size will take books three and one-half inches to ten and one-half inches wide, two and one-half inches to twelve and three-fourths inches high or long, and one-eighth of an inch to three and three-fourths inches thick, at a fast speed of eleven or a slow speed of seven books per minute; the extra large size will take books three and one-half inches to eleven and one-half inches wide, two and one-half inches to seventeen inches high or long, and one-fourth of an inch to three and one-half inches thick, at a fast speed of nine or a slow speed of six books per minute.

HINGES.

All spring-back books have hinges, which are made on the book after the rounding operation is completed. This is made by gluing the entire last waste leaf of the book, tipping the bands down and gluing, then folding three inches of the paper over, rubbing down, doubling up three inches more, and continuing the operation until the entire leaf is doubled up into a hinge near the convex edge of the back. Repeat this on the other side, then put a piece of zinc or tin between the hinge and the end-leaf to prevent the dampness from penetrating and the bands pressing into the book. The book is then carefully put between two boards into the press under a firm pressure and left to dry over night. The next operation is strapping.

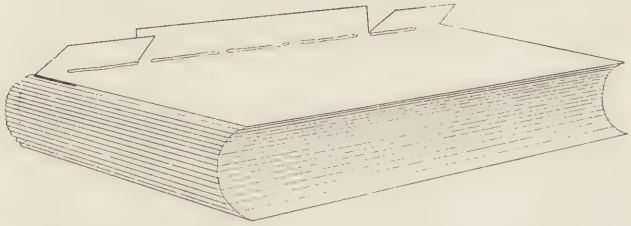
After the books are strapped and trimmed as described under those heads, take shears and cut close to the outer band to the edge of the back; also at the head and tail from one-half of an inch diagonally to the edge of the back.

STRAPPING.

After the hinges have been made on blank-books, leather straps are cut wide enough to project on the bands and long enough to extend two and one-half inches on the

hinges. Scraps of fleshers are principally used, and, when the supply is exhausted, goat splits are the best obtainable for that purpose. Pare the four ends, and paste with a medium-thick paste; these should set a while before stretching them over the back, in order to soften the leather and allow it to become tacky. Paste the back, and rub with the palm of the hand or paper shavings until all the surplus paste is removed; then glue the back with a medium-thick flexible glue. If head-bands are desired, they should be placed on the head and tail after they are trimmed before stretching on the leather. For this purpose silk head-bands are always employed, and, in order to get the proper width, cut four pieces and glue two together, making one for each end, which will give twice the width of the visible portion of the single band. The leather straps are then stretched between the bands and rubbed down.

A coat of paste on the fleshers or splits will facilitate rubbing-down, which should be done carefully, as on it the strength of the book depends. Zinc or tins are



inserted between the hinges and end-leaves, and the books are set aside to dry with the backs out. This operation is performed shortly before the close of the workday, so that they have ample time to dry over night. Books containing thin paper should be strapped with flexible glue, as paste would crinkle the leaves. Trimming and edging the edges is the next operation.

Loose-back books are strapped with one piece of fleshers or goat splits. Cut the leather large enough to

project about one and one-half inches on the sides, pare on both ends, then conclude the operation as above described.

BOARDS.

All but flexible or limp-bound books have stiff covers. The material primarily consists of binders' or cloth board. Where durability is the prime requisite, tarboard should be used. In order to cheapen productions, many binders substitute strawboard. This practice should be condemned on letterpress and blank books. Where permanency is desired, the best material should be used; but where the life of a book, as in manifold work, is but a few months, a cheaper material, such as straw, pulp or jute board, may be used.

The thickness of the board is governed by numbers, which range from 14 to 60. The number denotes the number of sheets in fifty pounds. Number 14 contains fourteen sheets to a bundle of fifty pounds; number 40 contains forty sheets to a bundle of fifty pounds. By the assistance of the following table of comparative thicknesses, any size cutting to special advantage may be readily selected and substituted for another of which the thickness is known:

COMPARATIVE THICKNESS OF BINDERS' BOARD.

No.	Size.	Points Thick.	No.	Size.	Points Thick.
14	22 x 28 or 19 x 30	200	15	22 x 34	152
15	22 x 28 or 19 x 30	186	20	22 x 34	113
16	22 x 28 or 19 x 30	175	25	22 x 34	90
18	22 x 28 or 19 x 30	156	30	22 x 34	76
20	22 x 28 or 19 x 30	140	12	26 x 38	142
25	22 x 28 or 19 x 30	112	15	26 x 38	114
30	22 x 28 or 19 x 30	94	18	26 x 38	95
35	22 x 28 or 19 x 30	80	20	26 x 38	85
40	22 x 28 or 19 x 30	70	25	26 x 38	68
45	22 x 28 or 19 x 30	62	30	26 x 38	57
50	22 x 28 or 19 x 30	56	35	26 x 38	49
55	22 x 28 or 19 x 30	51	8	33 x 44	146
60	22 x 28 or 19 x 30	47	10	33 x 44	116
			12	33 x 34	98
			14	33 x 34	84

COMPARATIVE THICKNESS OF STRAWBOARD.

No.	Size.	Calipers Approxim.	No.	Size.	Calipers Approxim.
25	26 x 38	.090	70	26 x 38	.032
30	26 x 38	.075	75	26 x 38	.030
35	26 x 38	.064	80	26 x 38	.028
40	26 x 38	.056	85	26 x 38	.026
45	26 x 38	.050	90	26 x 38	.025
50	26 x 38	.045	95	26 x 38	.024
55	26 x 38	.041	100	26 x 38	.023
60	26 x 38	.037	110	26 x 38	.020
65	26 x 38	.035	120	26 x 38	.018

BOARDS FOR LETTERPRESS BOOKS.— The thickness of the board is governed by the thickness of the book. The squares for laced-in books are one-eighth of an inch for

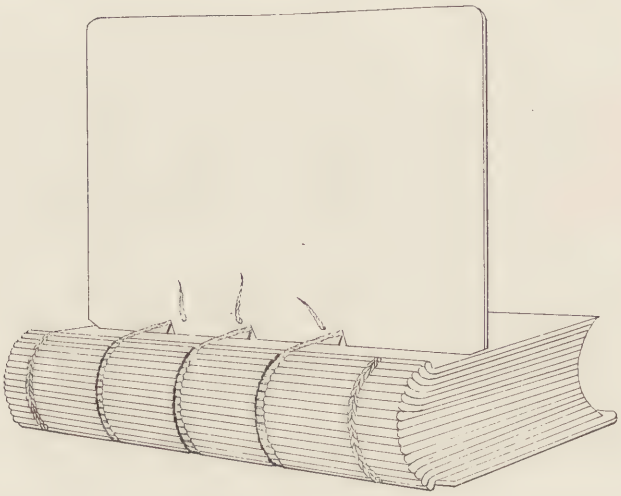
Table Shears.

the head, one-eighth of an inch for the tail, and three-sixteenths of an inch for the front. This should apply to all books up to ten and one-half inches in length. The squares on books longer than ten and one-half inches should be increased one-sixteenth of an inch. The size of the square above mentioned does not apply to art binding, as it is customary to embellish the squares in gold, and a greater visible surface is needed. The board should be cut to fit close to the backing ridge, and, if the backing is not perfectly true, it may be necessary to cut a little off the width on one end on a bias; then with a compass measure the squares, and cut with the board shears. This, in most cases, is essential on jobwork. On edition-work the boards are cut square with the shears or rotary cutter, and fitted to the books. All full leather books, and books which have a side pasted on, are lined with paper on the side which comes in contact with the book. The object of this is to prevent the warping of the cover outward. Some binders stretch their leather to such an extent that something is needed to counteract the warping of the board thus caused.

To avoid the wearing of the corner through the leather on the turned-in edge, and to admit of neat setting of the head, the corners of all boards should be cut. In considering the wear of a book, it is noticeable that square corners are mashed in a very short time. To remedy this, round the corners of the boards on all leather-bound books. A large round is not needed; in fact, it would look unsightly, but a neat, small round corner will enable the leather to be worked-in over the edge of the board, and produce a well-appearing book.

After the boards have been placed on the books and the squares adjusted, mark the position of the cords with a pencil; then punch a hole one-fourth of an inch from the edge with a shoemakers' awl; turn the board over, and punch holes one-fourth of an inch to the side. The cords are frayed out, pasted, tapered and inserted in the

holes from without, then inserted from within, pulled tight, and the holes closed with the handle of the knife which was used for fraying out. The cord ends are cut about one-fourth of an inch from the board, and are pounded flat on a beating iron. Care must be taken in pounding the cords, as the edge of the board can easily cut them if carelessly pounded. By cutting a groove from



the edge of the board to the hole, a much heavier cord may be used, and the book may be thus strengthened without rendering it unsightly, as the cord is imbedded in the groove. The books are then put into the press, avoiding a lopsided round, and running the press down firmly. The next operation is head-banding and lining. If the boards are to be beveled, it must be done before attaching them to the volume.

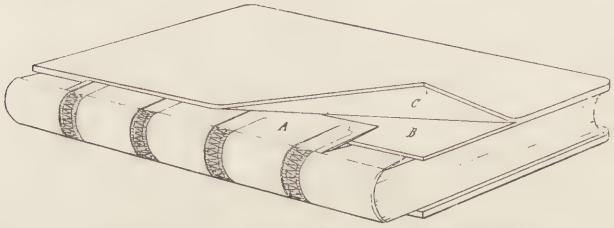
SPLIT BOARD FOR LETTERPRESS BOOKS.— Should it be necessary to paste two thicknesses of board together, either for lack of proper thickness of board or for the insertion of the hinge or tapes into a split board instead of lacing, cut the thicker board against the grain, so that

it will run the width rather than the length of the book. The thin board should be cut with the grain; that is, the length of the book. The crossing of the grain in the made board is a great help in producing a perfectly flat cover. Paste one board about two inches from the end with a medium-thick paste, and place the other on top; then press until dry. The press should come down lightly upon the board to prevent the different pieces from slipping. A firm pressure may be given when the paste has had a chance to set, and in this condition allow them to remain over night. The next morning remove from the press, separate them, and stand around to dry. Failure to do this will result in wrinkled leaves caused by the dampness penetrating the leaves of the books. Then cut the corners on the two ends to permit of a neat turn-in of the leather and setting the heads, after which round the corners on the fore edge and sandpaper the sharp edges to prevent the wearing through of the covering material. On tight-joint books it is preferable to have the thin board on the outside, in which case the thicker board must be lined with a sheet of print paper to warp or curve it inward.

If the books are sewed on tape, bend back the thin board, and apply a coat of thick paste; then place the thick board on the book close to the backing ridge, tip the tapes down, and close up the open portion of the thin board. The books are then put in the press, and under a firm pressure left to dry over night. This permits of a more even joint in the finished book than if the thin board were put next to the book, and gives greater strength than by lacing-in. The next operations are head-banding and lining.

Attaching the boards to open-joint books is done after the books have been head-banded and lined with fleshers (leather), and a portion of the ends from the hinge cut away to facilitate turning in the covering material. Then proceed as above described, except that the thin board is placed next to the book, and the board from one-eighth to

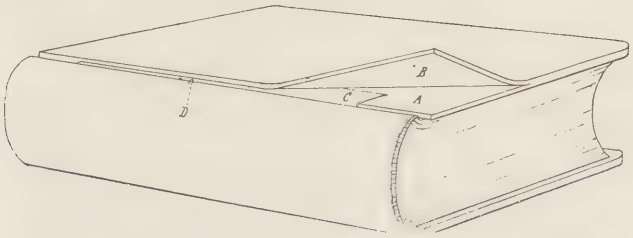
three-sixteenths of an inch from the backing ridge, with the hinge between the boards. The lining with print paper is eliminated, as the thin board has a tendency to warp inward. Cutting the board corners for the pur-



A — Hinge. B — Inner board. C — Outer board.

pose of facilitating turning in the leather and setting the heads is dispensed with.

BOARDS FOR CASE BOOKS.— The boards for case books should not be as heavy as ordinarily required for tight-joint books. The squares are of the same dimensions as above given. The width of the board is cut one-eighth of an inch narrower to provide space for the joint, and the pressing in of the brass-bound board close to the backing ridge in the subsequent operation. The boards are never lined, as no difficulty is experienced in producing a flat board in the finished book. The next operations are head-banding and lining.



A — Inner board. B — Outer board. C — Hinge. D — Open joint.

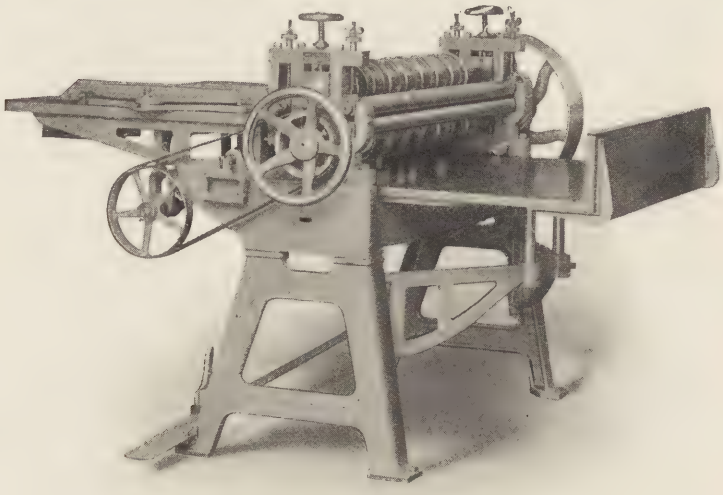
BLANK-BOOK BOARDS.— All spring-back blank-book boards consist of two thicknesses, and the thinner board is always the inner one. The thickness of the binders'

board varies from three-sixteenths to five-sixteenths of an inch, according to the size and thickness of the book. The boards are cut one-half of an inch longer than the length, and three-sixteenths of an inch narrower than the width of the trimmed book. The grains in the two boards should cross each other, as described in the chapter on letterpress boards. The two boards are pasted together, leaving about three and one-half inches unpasted for the insertion of the hinge in the subsequent operation. Glue may be used in making boards, but it should not be of a quick-drying variety; however, paste is always preferable when boards are made in advance.

The boards need not be lined with paper, as the thin board has a tendency to draw the thicker board, and being made so that it comes in contact with the book, warps the cover inward a trifle. When the covering material is unduly stretched, which is likely on moleskin or canvas, it is well to line the board. Never line the boards of books which are sided with glue and have the end-leaves pasted, as the pasted side has a tendency to warp the board inward, and an additional warp by lining is not desired. All sharp edges of the board should be sandpapered to prevent the board from wearing through the covering material. The open end of the thin board is bent back, and both parts are coated with glue. If the number of books warrants, paste may be substituted, thus enabling a greater number of books to be placed in the press before running the press down. This is an advantage which should not be overlooked, especially when there is plenty of time to dry. The size of the joint depends on the size of the books. On demy, medium, and double cap, the boards are set off from the convexed edge of the back about eleven-sixteenths of an inch. This will, if the board is cut as directed, give one-half of an inch for the front, and one-fourth of an inch for the head, also one-fourth of an inch for the tail square. Large books require a trifle larger joints, and smaller books smaller

joints. A safe way is to lay the joint rod one-eighth of an inch from the edge of the back, and draw a line as a guide for the edge of the board.

The following scale for medium and double cap will suffice to gauge all thicknesses of board. A somewhat



Robertson Rotary Board Cutter.

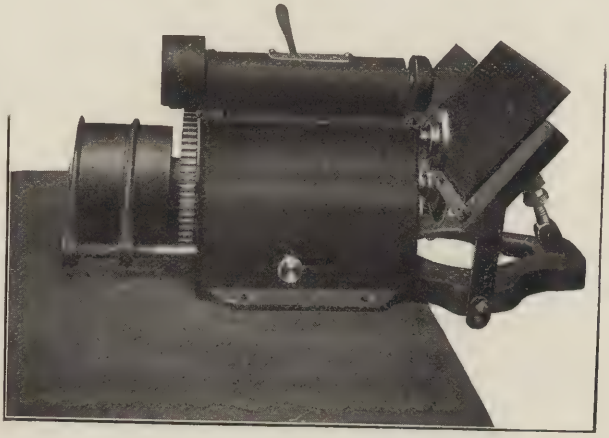
thinner board should, of course, be used for smaller books; thicker board for larger books.

200 pages, No. 25 and No. 35, 192 points thick.
300 pages, No. 25 and No. 30, 206 points thick.
400 pages, No. 20 and No. 35, 220 points thick.
500 pages, No. 20 and No. 30, 234 points thick.
600 pages, No. 16 and No. 40, 245 points thick.
800 pages, No. 16 and No. 30, 269 points thick.
1,000 pages, No. 16 and No. 25, 287 points thick.
1,200 pages, No. 16 and No. 20, 315 points thick.

Boards for half-bound, tight or loose back, are cut three-eighths of an inch longer than the length and one-eighth of an inch narrower than the width of the book,

and the corners rounded. The thickness depends on the size and thickness of the book. They are tipped on after the backs of the books are supered or lined with fleshers, and set off three-eighths of an inch from the convexed edge of the back, thus giving three-sixteenths of an inch for the head and three-sixteenths of an inch for the tail, also one-fourth of an inch for the front square. Or, cases may be made after the space between the boards has been ascertained. All blank-book boards should be round-cornered; this permits of a better turn-in, and the breaking is, to a certain extent, obviated.

BOARD-CUTTING MACHINE.— These machines consist of upper and lower rotary or circular steel cutters. The upper cutters are set close to the lower cutters, which cut

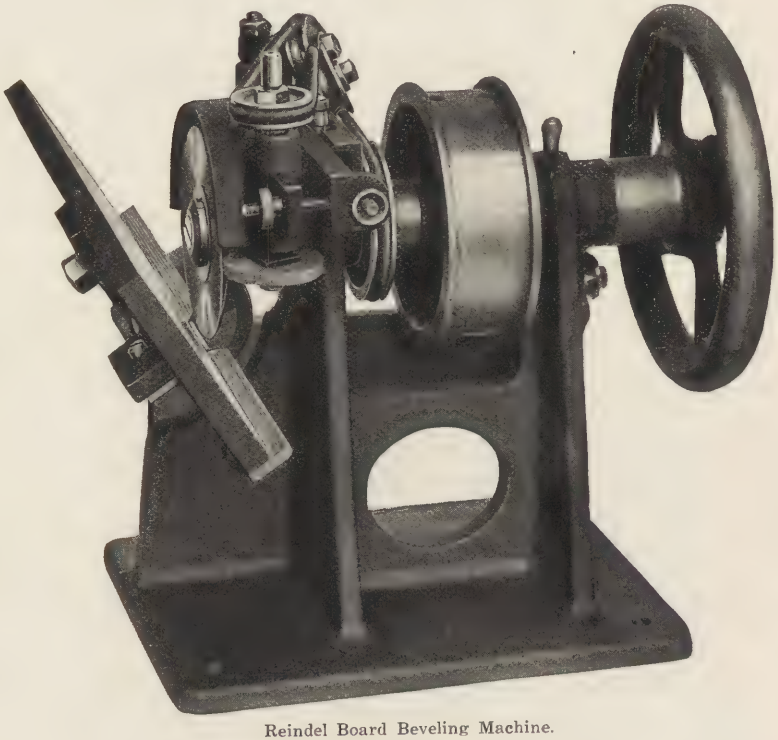


Crawley Board-beveling Machine.

the board as it is fed into the machine. These cutters are adjusted to cut the length of the board into the required size. The feeding is done by two steel rollers, which force the board against the revolving cutters, and the strips of board are carried out of the machine by two other steel rollers. The cutters are then set for the width, and the

board fed into the machine with one edge against the side gauge. These machines are made to cut board from one-sixteenth to one-fourth of an inch thick.

BEVELING BOARDS.— There is a machine designed to bevel tarboards, cards and photo mounts. It will bevel any angle, and the degree is regulated by tilting the slant-



Reindel Board Beveling Machine.
(Gane Bros.)

ing table over which the board passes. By frictional contact with a wheel, the board is fed from right to left. The circular knife rotates in the opposite direction from that of the feed wheel. The knife may be ground without removing it, by pulling the lever forward, which brings

the carborundum stone against the knife. When finished, the lever is released, and a spring carries the grinder back.

To enhance the appearance of letterpress books bound in full leather, the boards are beveled; the width depends entirely on the thickness of the boards. Blank-book boards should not be beveled.

HEAD-BANDS.

The object of head-bands on the head and tail of books is to hide the edge and enhance the appearance. This, in recent years, applies to letterpress books only. In former years blank-books were head-banded, but the taste for simplicity and the desire to cheapen production have made this custom obsolete. What is true on letterpress books applies with equal force on blank-books, and, to properly finish the books, head-bands should be put on. The head-bands on thin case books are eliminated because of the saving thus effected. Due to the short life of the average manifold book, it is not head-banded. Head-bands, made of cotton, silk, mercerized cotton, or calico, can be purchased from any supply house. Silk and mercerized cotton head-bands are used on the better grade of books, while the calico is used on all cheap edition work. Many binders prefer to make their head-bands of striped calico. This is done by cutting the calico into strips one and one-half inches wide, with the stripes crossing the width and the full length of the cloth, then taking six-ply soft twine and tying it from one end to the other of the room. Paste the calico, and place it over the twine, then turn over about one-third of the width, and rub the thumb-nail across so as to fit the calico close to the twine. When dry, paste a board, and place the head-bands on top of each other close to the twine after pasting each strip. The bands can then be cut the exact width of the book; put between a few pieces of damp burlap, and in this condition they will be ready for use for a number of days. The

burlap must be kept damp. All head-bands should be a trifle narrower than the squares of the board to permit two thicknesses of leather to be worked over and be even with the boards.

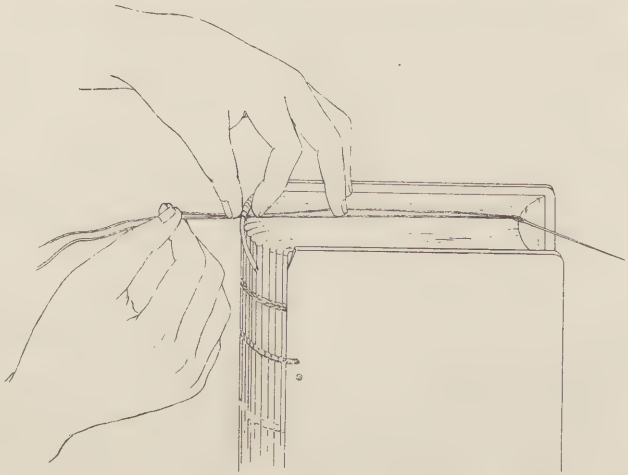
Another method is to make them on a board somewhat larger than the width of the calico. Nails are driven on both ends about one and one-half inches apart, and soft twine is fastened to one of them. Paste the strips of calico, and lay one on the board so that the twine when carried across to the other end will lay horizontally about one-third on the calico. Then fasten the twine on the opposite side, turn over the calico, and rub down close to the twine. The twine is then fastened to the nail below, and the operation as described is repeated.

Still another method is to drive but two nails, one on each end, and, when the first strip is completed as above described, the paste brush is run over it, and another made in the same way directly on top of the first one. The twine of the second head-band is below the first. This is repeated until a sufficient supply has been made for the work in hand. Cut a piece of binders' board the width of the back, lay on the head-bands, and cut them with a sharp knife.

HEAD-BANDS MADE ON BOOKS.— The ancient binders made all head-bands on the backs, and, in the majority of cases, employed different colors of silk. This style may be carefully executed as follows:

The books are put into a hand press or backing machine, the fore edge toward the operator. A strip of stiff leather is cut a trifle narrower than the squares of the book and longer than the width of the back. Red silk is inserted into a needle, with blue tied to the end. The needle is then inserted into the first signature on the left under the kettle-stitch through the back, and the cord is pulled until the knot is reached. The needle is then inserted in the same place, and the cord pulled until a loop is formed, in which the strip of leather is inserted when it

is drawn to the edge. The blue is brought over from the back and held tightly with the left hand. The red silk in the needle is picked up with the right hand, and the two brought over the leather. The blue is twisted around the red and then around the leather; the red is then twisted around the blue and leather; this is repeated until the



entire leather is covered. The needle must be passed through the back at about every sixth or seventh signature. It must be even and tight to produce a neat, flat head-band.

Three colors can be worked in the same way, alternating them or winding each two times. Any number of methods will suggest themselves when this is mastered, and patience spells "Success." There is no doubt that this is a strong method, and should find favor in modern binderies when good books require permanent covers.

HEAD-BANDING AND LINING.

The head-banding and lining (or loose back) is usually made in the least possible time, and little attention is paid to the necessity of the lining sticking to the back. Some

forwarders, in the " hurly-burly " of the every-day shop, rub the backs with the palms of their hands, eliminating the folder. The constant opening of the book demands that the back lining be of a strong, thin material, well glued to the back.

Ordinarily, all letterpress books should have head-bands and the back lined with super, muslin, paper, or thin leather. On thin books which are made for cases, the head-bands may be eliminated. All stiff-cover case books are made loose back, and flexible or limp leather are made tight back. The back linings on these styles are somewhat different. For books to which the boards are attached to the sewing either by lacing the cord or pasting the tapes between two boards, the back lining is radically different from that for case books.

HEAD-BANDING CASE BOOKS.— To head-band case books, prepare the head-bands as described in the preceding chapter; cut them the exact width of the back, then cut super one-half of an inch narrower than the length, and two inches wider than the width of the back. Cut soft rag paper a trifle smaller than the length and width of the back to allow for the stretch when pasted. Pile up the books on the zinc on the right side of the bench as described under " Rounding," laying them on the backing ridge of each other, then gluing the backs with a flexible glue about as thick as cream. Pick up a book with the right hand and a head-band with the left, place it on the head close to the edge, then turn the book, and pick up another head-band, putting it on the tail close to the edge. The super, being laid in front, the back is laid on it and rubbed down with the palm of the left hand, and the book is then laid aside. Repeat the operation until the glued pile is finished and laid aside, with the backs out. The head-bands are then carefully gone over with thumbs and index fingers, and the super rubbed down with a folder or a piece of binders' board. This is done while the books are in a pile. The head-bands, having been pasted and

kept soft in the burlap, enable the forwarder, with little effort, to stick the head-band to the back. With dry head-bands the glue should be allowed to set before putting them on.

After enough books have been head-banded and supered so that the glue is thoroughly dry, put the backs together, as above described, and apply a thin coat of flexible glue. Paste the back lining-papers, and put them on the backs. Then lay aside, with the backs out, and rub down with a soft rag and folder.

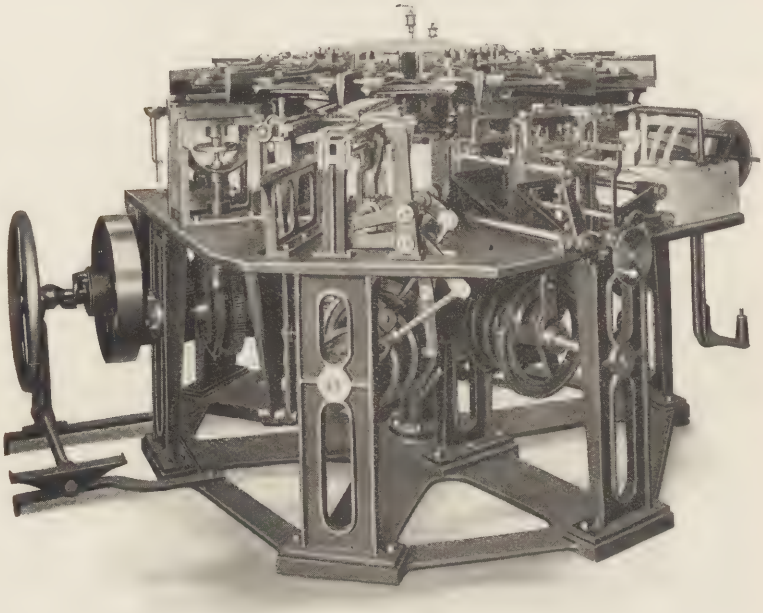
A somewhat stronger lining consists of a thin piece of leather, pared on the ends, pasted over the back, and projecting about one-half of an inch on the end-leaves. The super and back lining-papers are eliminated. Books prepared for flexible covers are head-banded and supered; the back lining-paper is eliminated, because the back is glued to the leather of the case.

The next operation is making cases. The books are then ready for cases.

HEAD-BANDING AND LINING MACHINE.— The head-banding and lining machine also will super and line the back without head-bands or super, and glue the back without either head-bands or paper lining. It will head-band and line books from five and one-half inches to twelve inches in length and from five-eighths of an inch to two and one-half inches in width (measured across the joints on a straight line); the width is only limited by the size which may be handled with ease, as the book is fed back down, and there is nothing to interfere with the fore edge.

All the cams and gears for driving this machine are underneath an iron table, and on this table is assembled a series of small machines. Each is independent and can be cut off to suit the class of work to be done. All are controlled from the feed table by the operator. This avoids a waste of material when the machine is running without books in the jaws. Over these machines there is a rotary carrier with fourteen jaws for books, fourteen being the

limit to the number of books in the machine at one time. At the feed table the book is automatically fed into the jaw. The carrier then moves the book around to the first glue machine, where a coat of glue is applied to the back of the book. The book is then moved around to the super apparatus, where the super is fed the proper



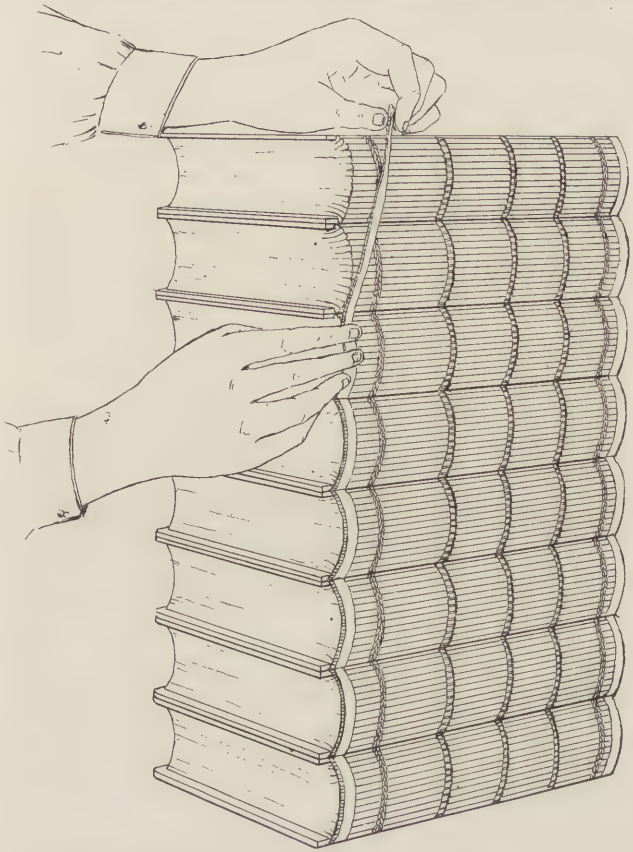
Bleauvelt Headbanding-Lining Machine.

width, cut to size, and applied to the back of the book, which then passes around to the second glue machine, where a coat of glue is applied over the super. The book is next moved around to the head-band machine, where the head-band is automatically made, cut to size, and applied. The silk and the common striped muslin head-bands can be purchased in two-hundred-yard rolls.

After the head-banding the book passes around to the paper-lining machine, where the paper lining is pasted,

cut to size, and applied. The book then returns to the operator, who removes it and feeds in another book in the same jaw.

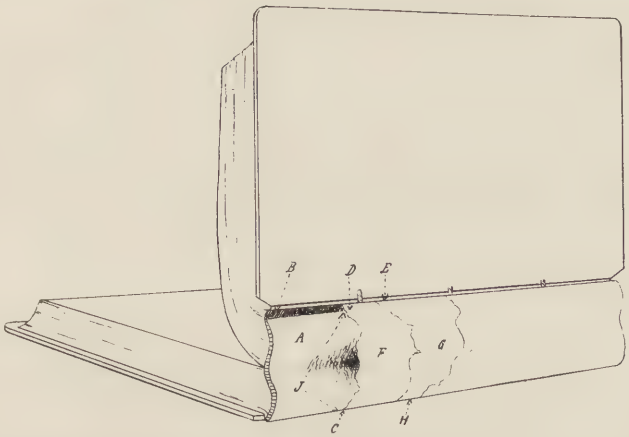
The machine is speeded to fourteen per minute, and has an average output of five hundred books per hour.



HEAD-BANDING TIGHT-JOINT BOOKS.— On all books that have the boards attached to the sewing, either laced in or with the tape, super or leather pasted between two thicknesses of board, silk or mercerized cotton headbands should be used. These must not be pasted, as the

color is apt to run and render them unsightly. Place the books to the right, and stack them up on the zinc; glue the head and tail ends with a flexible glue as thick as cream, and put the head-bands on. They should be pulled snugly on the back, so that the band is close to the book edge. Take a sharp knife, and cut the head-band, pressing the knife between the boards. When this is done, rub down with index fingers and thumbs, and lastly, with a folder; or the head-bands may be cut the width of the back, glued and placed one at a time. The visible portion of the head-band should fit snug to the edge. Then cut a piece of soft rag paper the width of the back and long enough to fit between the head-bands. The object of this is to even up the back. The heads and tails are always thicker than the middle, because of the head-bands and turn-in of the leather back. Place the book on the right, glue the backs between the head-bands, as well as the paper which is put on the backs, commencing at the bottom and working up. Then take a soft rag, and rub down firmly. Remove one book at a time from the pile, and rub down securely with a folder. Care must be taken that no more books are glued than can be done before the glue hardens. Then cut soft rag or cover paper so that the grain runs the length of the book. This may easily be determined by folding the paper — if folded against the grain, the paper will possess a break of uneven appearance, whereas, if folded with the grain, the paper will present a straight crease. It is cut three times the width, and the length from the edge to the edge of the head-band. Stack the books up to the right, with the backs even; then cover the entire back and head-bands with glue. Remove the pile to the left, and prepare another pile for gluing. The first pile will have reached that tacky state so much desired in back lining. Then take one book at a time, and lay the lining paper about one-eighth of an inch from the edge, and then carefully rub down with the folder. Fold the paper over at the edge of the back, turn

the book, and bring it over to the one-eighth of an inch which was left uncovered. Rub firmly with the folder, and fold the paper over at the edge of the back. Take the book in the left hand and the folder in the right; then oscillate the book, the back being on the bench, and, with the folder, follow the head-band. This is essential for the



A — Paper glued to the back. B — Glued portion not covered. C — Paper folded. D — Paper glued to the back. E — Paper folded over. F, G — Glue. H — Paper trimmed close to the edge. J — Loose back.

neat head, but care must be taken to avoid forcing the head-band from the back. Then pile the books with the backs over the edge of the bench. Then hang over paper between the boards; glue the backs, and bring over the paper carefully, rubbing with a folder. Should the paper be cut larger than required, it must be cut with the shears close to the head-band, and the surplus on the width may be removed with a sharp paring knife. This operation is repeated until the entire order is completed. The books are then ready for bands.

Additional strength is needed for thick books, and the back lining is made as follows: Cut a piece of rag paper and muslin or thin skiver the length and twice the width of the back. Glue the back with a flexible glue, and lay

the muslin, drilling, or skiver down even with the edge of the back. Rub down with the folder, and fold the material over even with the other edge. Then fold the rag paper, and glue one-half, which is placed on the back, the edge of the paper even with the folded drilling or skiver. This is rubbed down and folded over on the edge, which gives one-half of the paper on one side and one-half of the drilling or skiver on the other. Glue the outside of the paper, and bring the drilling or skiver over, and rub down. Then paste another piece of rag paper on the outside, rub down, and trim the surplus at the heads and ends. Care must be taken to prevent surplus material hanging over the back edges, as a smooth, even joint is impossible if this operation is carelessly done.

To facilitate banding thick books, rule the lining-paper where bands are to be placed; then use care in lining the backs, so that the paper will be even at the head, and the fold be straight.

LEATHER LINING.—A tight joint is impracticable, and a split board indispensable, for books, such as law books, which are in constant use. Especially is this true on thick books. To strengthen these, cut the leather lining of goat splits or skivers to allow one and one-half inches on the sides or three inches longer than the width of the back, and pare on the long ends. Head-band the book, then paste the leather, and draw it evenly over the back. Rub carefully, close to the backing ridge, and set aside to dry, with the backs out. The paper lining is then glued to the back, as described under a preceding head. The hinges thus formed are inserted between the thicknesses of board, after about one inch on each side has been cut away to permit the turn-in of the covering material. The boards are placed about three-sixteenths of an inch from the ridge to permit a free opening and distribute the wear over a greater area than on a tight-joint book, a laced-in book, or one in which the tapes have been pasted between two thicknesses of boards. The covering material is not

rubbed in the joint, but covered like a laced-in book. The end-leaves are pasted and the books pressed with a drier between end and fly leaves.

BANDS.

The object of putting bands on the back of letterpress books is to enhance the appearance and protect the lettering and embellishment. These may be glued to the back as fancy dictates or in keeping with subsequent ornamentation. Sometimes two bands are put close together at the head and the tail to enable the finisher to execute some particular design. The usual finishing adapts itself to four and five bands. Four bands are most used on ordinary library books, such as russia, roan, or sheep; while five bands are effectively used on morocco and calf bindings.

The bands are made by pasting several pieces of leather together with a piece of paper on both sides. These should remain under pressure until dry. The width and thickness depend on the size of the books. Ordinarily, one-eighth of an inch will meet the requirement for height and width. Soft twine or cord, about six-ply, may be substituted when there is no finishing on the bands. The customary way of placing the bands is to measure one-half of an inch from the head-band at the tail, then from there to the edge of the head head-band the spaces are made equal, the division being five or six, according to the number of bands desired. The back lining is then glued, and the band placed below the division mark, allowing one-half of an inch to project over the back edges on the board. If the bands are put on when the glue feels tacky, a greater probability of putting the bands on straight is assured. When delicate leathers or covering materials are required, the back lining should not be glued, but the paper on the leather should be glued before cutting into strips. (Glue is apt to stain delicate material, hence the precaution.) To put them on, dampen the glue and place

as above described. When all is dry, the bands are cut with a sharp paring knife even with the edge of the band and at about one-eighth of an inch slant to prevent the band from coming in contact with the table in the bound volume. The next operation is cutting and paring leather, or the preparation of other covering material.

SPRING-BACK.

For spring-backs the best tar or fiber board should be used. The constant opening and the weight of blank-books make it imperative that great solidity be attained. A thin board will sag and flatten, and a heavy board, unless great care is taken in concaving it, will split. Hence it follows that a thicker board than No. 20 should not be used. The following will suffice to show the relative thicknesses to be used:

For demy, 200 pages, No. 35; for medium and double cap, No. 30.

For demy, 300 pages, No. 30; for medium and double cap, No. 25.

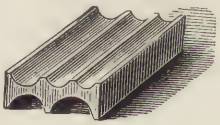
For demy, 400 pages, No. 25; for medium and double cap, No. 20.

For demy, 600 pages, No. 20; for medium and double cap, No. 20.

Reinforcement for books from six hundred to one thousand pages should be with No. 50 binders' board. This is glued on the back after the board is concaved. The back of a book of one thousand or more pages should be reinforced with No. 40 tarboard.

To measure the width of the back, take a rule or straight-edge, and lay it on the hinge one-eighth of an inch from the edge of the back, and draw a line; repeat this on the other side; then take a strip of paper, and measure on a band from the mark on one side to that of the other. Cut the board that width and the exact length of the boards on the book. With a sponge saturated with

hot water, wet the one side, or immerse it in hot water; either way will do. Then dry one side by pulling it over a flame; bend the board over a pipe, the dry side coming in contact with the pipe. Place the board in the forming iron or mold, and, with a round stick, rub it until it



Blank-book Back Moulding Iron.

assumes the shape of the mold, which will fit the back of the book. It should not be formed too deep, but sufficiently to fit close to the back. Then pull the back over the flame until dry. During this process, should the back draw so that it becomes necessary to put it back into the forming iron or mold, it must be done before it becomes thoroughly dry.

This done, cut a piece of ledger paper the length and thrice the width of the back, glue it, lay the back in the center, and turn in first one side, then the other. With a folder carefully rub down, and lay aside. To facilitate rubbing down, wet one side of the paper, and glue the other. When the back is dry, the paper will shrink slightly, and assist in keeping its shape. Then cut a piece of gray rag or manila paper the width of the concaved back plus one inch for the joints, and the length three inches less than the length of the back. Glue the concave of the back, and center on the paper; this will leave one-half of an inch projecting on both sides. When dry, glue the projecting ends of the paper, lay the back board on the back of the book, adjust it so that the back will be even with the board, and the projecting edges even on both sides, then rub the paper in the joints, and rub firmly with the folder.

To further strengthen the back when plain or extra hubs are used, cover back and joints with drilling. Use

paste for this. Thus the spring-back is completed, and the joints of the book formed.

Rods are made in different sizes and thicknesses, and at no time should a thicker or thinner rod be used than the thicknesses of the board, nor wider than the joint in the subsequent pressing. The next operation is gluing hubs on the backs.

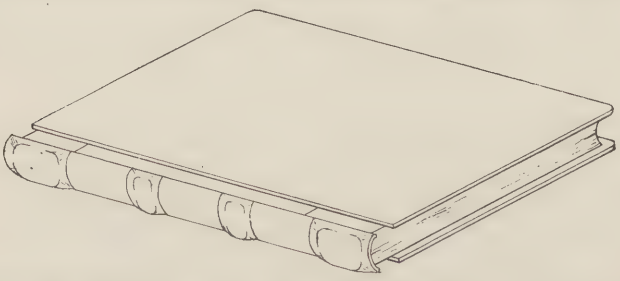
There are several styles of back-molding machines on the market which make a solid back and minimize the splitting of the board. One style is set by moving the fingers, to which canvas or wire is attached, on the rods over pipes which are heated with steam or gas. Another style has a strong spring mesh on which the tarboard is laid, and by turning a handle, pressed on a pipe heated with gas. Another machine is the mold and press arrangement. The convex forms in the press head may be changed to conform to the mold, which will hold the size of the tarboard to be formed. The mold is then heated, the tarboard inserted in the mold, and the press run down.

HUBS.

For many years progress in blank-book manufacturing has been dormant, and practically no effort has been made either to strengthen or to improve the appearance of the book. Hubs are glued to the spring-backs to protect the lettering on the back, as well as to strengthen and enhance the general appearance. For this purpose, some binders use thin binders' or straw board, while others prefer leather, and glue several thicknesses together until a sufficient height is obtained. This height is from one-eighth to one-half of an inch, in keeping with the size and the thickness of the book. Aside from the fact that the hubs protect the lettering and render a more pleasing effect, their utility as to strength is questionable. It is a common occurrence for bookkeepers to jar the books, so that the hubs invariably become loose by contact with the desk. This in itself ought to suggest a remedy, but,

strange as it may seem, little, if any, effort has been made in the last decade to remedy or improve this defect. To a great extent the same argument prevails against the continuance of the old style extra hubs. Beveled extra hubs improve the appearance of blank-books, and permit the finisher to practice simplicity in embellishing the same. The ancient idea that a full-gilt back enhanced the appearance is to the up-to-date craftsman erroneous; and designs and flower stamps which have been used from time immemorial are of little use in account-book finishing to-day. To substitute beveled hubs would overcome all objections. That style has many advantages over all others, as it saves time in putting the book in leather, and by stamping the backs before the leather is pasted and drawn on, eliminates hand-lettering to a large extent. There is no working-in of the leather close to the bands, or working-out of the wrinkles on the sides, no rubbing-up and expending elbow grease, and no loose hub after a few months' wear.

PLAIN BEVELED HUBS.— Plain beveled hubs may be made of straw, pulp or binders' board. Divide the length of the back into twenty-four equal parts, then cut the hub



material for the head and tail four-twenty-fourths; for the two center hubs, two-twenty-fourths, and about four inches longer than the width of the back. The boards should be cut so that the grain will run the length of the back after the hubs are glued on. The thickness of the hubs depends on the size and thickness of the book. The

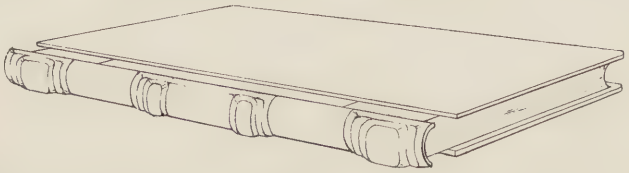
following, based on No. 70 strawboard for medium or double cap books, is given as an approximate guide, and may be altered as required:

200-page book, 5 layers.
300-page book, 5 layers.
400-page book, 6 layers.
500-page book, 7 layers.
600-page book, 8 layers.
800-page book, 9 layers.
1,000-page book, 10 layers.
1,200-page book, 11 layers.

The book is put in a bench press, the boards for the head and tail hubs are glued, and, when they feel tacky, are placed on the ends on top of each other until the desired height is attained. The edge of the hub is even with the edge of the spring-back. The two center hubs are put on in such a way that three equal panels of four-twenty-fourths are left for titles. Beveling and trimming of the hubs must not commence until the glue is dry. The sides are then trimmed even with the edge of the board and given about one-eighth of an inch slant to prevent rubbing on the table when the bound book is in use. To bevel the hubs, take a pair of compasses, measure off one-half or three-fourths of an inch, and mark the hub on both ends, then take a sharp paring knife, and cut away from the mark to the spring-back. When this is done, take a coarse sandpaper, and taper the bevel until it is smooth. Beveling can be done with the machine if the hubs are allowed to set; they can be put on before they get too dry. To strengthen the back and hubs, cut a piece of drilling large enough to cover the back and joints, paste it, and stretch over the hubs, working it into the joints. This strengthens the book where it is most needed. When dry, the book is ready for covering.

Extra Beveled Hubs.— Divide the length of the back into twenty-four equal parts, and cut the board for the lower head and tail hubs four-twenty-fourths, and eight-

twenty-fourths for the center lower hub. Cut the board for the upper head and tail two-twenty-fourths, and one and one-half twenty-fourths for the upper center hubs and four inches longer than the width of the back. The lower hubs should not be as high as the upper hubs. The



following scale is based on No. 70 strawboard for medium or double cap books, and may be altered to suit the occasion:

200-page book, 3 layers for the lower, and 4 for the upper hubs.

300-page book, 3 layers for the lower, and 4 for the upper hubs.

400-page book, 4 layers for the lower, and 5 for the upper hubs.

500-page book, 4 layers for the lower, and 5 for the upper hubs.

600-page book, 4 layers for the lower, and 5 for the upper hubs.

800-page book, 4 layers for the lower, and 6 for the upper hubs.

1,000-page book, 4 layers for the lower, and 6 for the upper hubs.

1,200-page book, 4 layers for the lower, and 7 for the upper hubs.

Glue the board for the lower head and tail hubs, and place them even with the edge of the board, while the lower center hub is placed on the center between the two, which leaves two panels four-twenty-fourths on the spring-back for titles. Glue the upper hubs, and center those for the head and tail on the lower hubs, while the two center upper hubs are placed one-twenty-fourth from

the edges of the lower center hub, thus leaving three-twenty-fourths for the center title space. Bevel the lower hubs about one-fourth of an inch and the upper about one-half of an inch; this, too, is gauged by the thickness of the hubs, and the eye will quickly recognize shortcomings in beveling. The trimming and pasting of drilling on the back and joints are done as described in the preceding chapter.

EXTRA HUBS.— These are made by dividing the length of the back into five equal spaces. For convenience in describing, each space is called a " panel." The material for the lower hubs for the head and tail are cut one-half of an inch narrower than the width of a panel and four inches longer than the width of the back. The material for the lower center hub is cut the exact width of the panel. The upper hubs for the head and tail are cut one inch narrower than the lower hubs. The two narrower hubs for the center are cut three-eighths of an inch wide. The thickness of the hub is gauged by the size and thickness of the book. The scale as given under the preceding head will, in most cases, suffice. The hubs are glued on at the head and tail even with the panel division mark, which leaves one-half of an inch space from the edge of the spring-back to the hub. The center lower hub takes up the entire center panel, and the two upper narrow hubs are glued one-half of an inch from the edge of the lower center hub. The upper head and tail hubs are centered on the lower hub layers, which leaves one-half of an inch margin from the edge of the lower hubs on both ends. When dry, the hubs are trimmed as described under " Beveled Hubs." These hubs are not beveled.

This style enables the finisher to embellish the back in an elaborate manner, but one which is hardly in keeping with the blank-book style.

HUBS.— The hubs for spring-back books, such as full canvas, full duck, full moleskin, corduroy, full-bound ends and hubs, full russia, and three-quarter russia, are made

of strips of straw or binders' board. Some prefer to use leather-made hubs, claiming that they will not wear the leather through by constant friction on the desk. Leather hubs are made of leather scraps by gluing pieces together until the proper height is obtained, and pressing until dry. The following widths are standard in most establishments:

Cap	8½ by 14 inches....	½	inch
Demy	10½ by 16 inches....	⅝	inch
Medium	11½ by 18 inches....	¾	inch
Double cap	14 by 17 inches....	¾	inch
Royal	12 by 19 inches....	⅞	inch
Superroyal	12½ by 20 inches....	1	inch
Double demy...	16 by 21 inches....	1⅛	inches
Double medium	18 by 23 inches....	1¼	inches

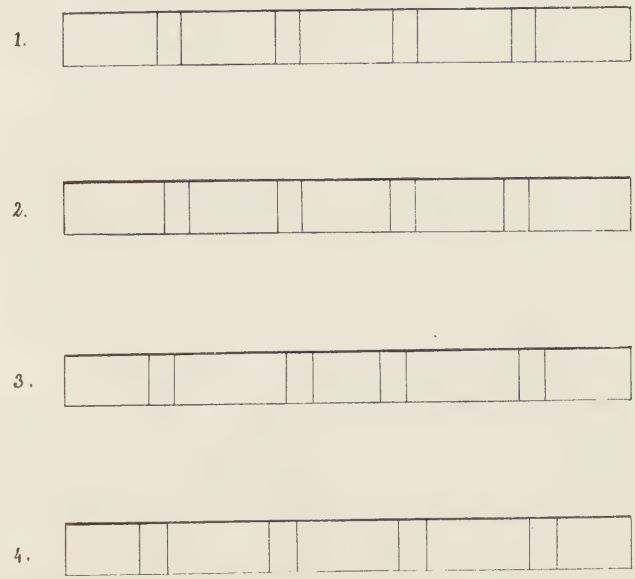
The height of the hubs depends on the thickness of the book, and the following will serve as a guide for the above-mentioned styles, the basis of comparison being the thickness of No. 70 strawboard:

200 pages, 4 layers.
300 pages, 4 layers.
400 pages, 5 layers.
500 pages, 5 layers.
600 pages, 6 layers.
800 pages, 7 layers.
1,000 pages, 8 layers.
1,200 pages, 9 layers.

This scale may be used for full-bound russia ends and hubs by the addition of one to each layer number.

(1) To determine the hub spacing on books covered with one piece of material and for three-quarter bound styles, divide the back so as to have five equal panels. This is done by placing a hub strip at the head, and dividing the space from the edge of the strip to the tail edge of the spring-back into five equal spaces. The hubs are glued below the mark.

(2) On full-bound russia ends and hubs, the three panels are of equal distance apart, and the head and tail are the width of a hub narrower. To obtain this division of panels, take a strip of the board to be used for the hub, put it close to the edge of the spring-back, and measure with a pair of dividers from the edge of the hub; remove the strip, and place it next to the other end of the dividers. Hold the strip in place, and place the dividers to the edge of the strip; remove it, and place close to the dividers on



the farther end. Hold the strip in place again, and repeat the operation for the third and fourth hubs. The last division must be from the edge of the hub strip to the edge of the strip placed against the tail edge of the spring-back. The width between the dividers may be increased or decreased as desired, so that the divisions will be even from the edge of the strip placed against the head to the edge of the strip placed against the tail, with four hubs laid on the back as above described.

(3) Another method is to divide the back into five equal spaces, placing the head hub above and the tail hub below the marks. Place a strip of the board close to the head hub, and divide from that edge to the edge of the tail hub into three equal spaces. The two hubs are then glued above the divider marks.

(4) Another method employed, where more space is required for the center panel, is to measure off:

2⅛ inches for cap,
2¼ inches for demy,
2½ inches for medium and double cap,
2⅝ inches for royal,
2⅞ inches for double demy.
3 inches for double medium,

from the edge of the head and tail, and place the hubs beneath and above the marks. The center space between the hubs is divided into three equal parts, and the hubs are centered on the division marks.

BOOK CLOTH.

" Common " and " extra " book cloths are trade names given to certain cloths finished by processes entirely different from the ordinary or so-called " linen " finish. Both are very popular for use on works of fiction, owing to their bright and strong color effects. They are supplied in about a dozen different embossings, the most popular of which are the " T " pattern and " silk " pattern. These are the only cloths supplied in all different embossings. The so-called " linen " cloths are to be had only in the " T " and " silk " patterns.

COMMON CLOTH.— This is a fine weave of cotton cloth which is first treated to a bath of dye in the required color. The surface is then covered with a light coat of color. These treatments partially conceal the thready appearance, and give the cloth a solid color effect.

EXTRA CLOTH.— For extra cloth a better grade of gray material is used. This is not dyed, but a very heavy coating of color is applied, which entirely conceals the weave, and gives a strong, solid color which is not obtained by any other process. On account of the large amount of color used, together with the extra process work, this is necessarily a high-price cloth. It is the most popular cloth in the market for novels and for general work. It can not be very highly recommended for its wearing quality. The best feature of the cloth is the strong, rich coloring, which has a solid enamel appearance.

FAULTY CLOTHS.— Difficulties of more or less importance are experienced with book cloth. The following are given simply to show what problems the manufacturers have to contend with. In many cases the trouble originates with the binders. Poor glue or paste, inferior ink or sizing is used, the case-making machine is not properly adjusted, and in many other ways a perfect cloth is misused.

TENDER CLOTH.— Caused by gray cloth of inferior quality or by damage during manufacturing.

NON-ADHERENCE.— Binders are occasionally troubled because cloth will not stick to the board. In these cases the cloth has a finish or treatment on the reverse side that resists the grip of paste or glue.

OFF SHADES.— Publishers and binders have many causes for complaint, but perhaps the greatest is on account of the variation of the shades in different lots of the same color. It is one of the great and constant problems of the manufacturers to maintain shade uniformity. There are times when the shades are so close that complaint seems altogether out of reason. Unless used for set work, a slight variation should not be a matter of complaint. Complaint of inferior quality is justifiable.

CLOTH THAT WILL NOT STAMP.— Occasionally a cloth will resist ink. This means that the finish is too hard, or that the surface treatment contains ingredients that offset the adhering quality of ink or leaf.

BUCKRAM.— This is a coarse, open-woven, cotton or linen fabric, colored and stiffened. Because of the premature decay of leather, especially sheep, buckram has been substituted by many law publishers. It is worked in the same way as cloth, and, when used to cover tight-joint books, it can be pasted and worked over bands in much the same way as leather. All heavy publishers' books which are frequently referred to should be bound in this material instead of cloth.

DUCK OR CANVAS.— This is a strong, heavy, cotton cloth, firmly woven. It can be procured in nearly all colors. The darker shades are frequently used for sides on three-quarter-bound books, and the lighter shades for large periodicals, newspapers, and the cheaper grade of account books. The principal objection to its use is that it collects dust, the light shades are soiled in handling, and it is disagreeable to touch. The lettering and filleting are done with ink on the lighter shades, and paper or leather for titles are used on the darker.

LEATHER.

The nature of the bookbinding art demands a covering material which will last for centuries, as it preserves the thoughts of people and passes them on from one generation to another. The strength, flexibility, and surface of leather adapt it to book covering. In this the artisan finds a material which enables him to execute ornaments and designs in keeping with the character of the text.

In this day and age, competition, which always tends to cheapen production, has infested the leather manufacturing to an alarming degree. The leather on a large

number of books that were bound during the second half of the nineteenth century has perished. In London the Society of Arts appointed a subcommittee of experts in 1900 to investigate the premature decay of modern leather used in binding, and to find a remedy. This committee, as a result of exhaustive investigation, issued an elaborate report in 1905, which contained colored plates, showing the different stages of decay and the action of the various chemicals used in tanning leather, as well as samples of leather properly prepared in accordance with their conclusions. Many recent bindings showed evidence of decay after so short a period as five or ten years. This report should be studied by all interested in good bookbinding, as it contains valuable information regarding the deterioration of leather bindings, the preparation of leather for bookbinding, hints to owners and keepers of libraries, and the fading of color from dyed leathers, as well as specifications for binding books.

This article on leather is largely based on their report.

"PREMATURE DECAY OF LEATHER.— The causes of the decay of modern leather bindings are set forth in the following:

"1. The introduction of tanning materials other than oak and sumach, stronger in tannin, and more rapid in their action. Many of these tanning materials are unstable, and the leather produced disintegrates on exposure to light and air.

"2. The use of dried and cured skins of variable soundness imported from abroad, such as goat, calf and sheep skins; some are dried in the sun, some salted, while others are cured with various ingredients.

"3. The use of infusions of acids and other bleaching agents to produce bright and even shades of color.

"4. The use of sulphuric or other mineral acids for the purpose of developing the depth of color during the process of dyeing.

"5. The shaving and splitting of skins for producing an even substance.

"6. Printing and embossing grains upon leather, together with other methods of finishing now in common use.

"7. The stripping, scouring, souring, and retanning of East India leathers (Persian).

"8. The removal of the natural grease or nourishment of the skin.

"Other factors in the deterioration of leather bindings are: (a) gas fumes, because of the sulphuric acid they contain, which has a disintegrating effect on leather; (b) damp, because it encourages the growth of mildew; (c) tobacco smoke (of which ammonia is an ingredient, because it has a darkening and deleterious effect on leather); (d) daylight, more especially direct sunlight; (e) excessive dryness of the atmosphere; (f) the wetting and stretching of the leather in covering; (g) the use of oxalic acid or vinegar by bookbinders for washing the leather; (h) the use of 'hollow backs'; (i) sewing on too few or too thin cords, or not lacing them into the boards; (j) injurious decoctions erroneously applied as preservatives to bindings.

"By taking full cognizance of the deleterious agencies which it is now known affect leather bindings, librarians can do much to mitigate the evils. They should pay attention to the proper ventilation of their libraries — especially top ventilation, as books stored on the upper shelves of a room are naturally most subject to excessive dry heat. The temperature must not be too high, as leathers do not like warmth, and in buildings heated by hot air care should be taken to prevent the air from becoming too dry. Where possible, valuable books should be kept in tightly fitting glass cases, as these are conducive to the preservation of books."

PRESERVING AGENCIES.— If preservatives be applied to bindings, it should be done only with preparations that

are definitely known by experience to be harmless. Glaire, vaseline and paraffin, when dissolved in benzine, are all regarded as harmless. Leather can be livened up without harm by giving it a slight coating of egg yolk and oil, or egg yolk and pure soap mixed to a thin, frothy emulsion, once every five or seven years. Lanoline, sheep's fat, is the most natural fat that exists, and is an extremely good substance for this purpose, but it is too thick for use on leather, and must be reduced by adding a small quantity of water.

MILDEW.— To arrest mildew, saturate a piece of flannel with any essential oil, and rub the books once every two or three weeks. Books which are spotted from mildew can be improved by washing with a weak solution of alcohol, and, when dry, by rubbing vaseline with absorbent cotton into the pores of the leather.

PIGSKIN.— This leather is durable, because of its coarse, tough fibers. It has a smooth, hard surface, characterized by hair scars. It is one of the strongest skins manufactured for tensile strength, durability, or frictional wear. Of the old leathers (fifteenth and sixteenth centuries), white pigskin has proved to be by far the most durable, and has lasted well in an undyed condition. Some modern, colored pigskin bindings have perished in a comparatively short time.

Because of its strength and durability, it should not be used indiscriminately, but should be confined to large and heavy volumes and account books.

SEAL.— This skin is furnished by the seal which abounds in the Polar regions, Greenland, North America, and the northern coasts of Europe. It has strong, tough fibers, which make it durable and capable of resisting hard, rubbing wear. It contains a quantity of natural oil, and is superior in suppleness and toughness to goatskins. It has an agreeable touch, and the lustre of the grain enhances its appearance. There are no drawbacks

of soft flanky or belly parts as in goat, and it is very economical to use.

LEVANT MOROCCO.— This leather originally came from the Levant countries, hence the appellation "Levant morocco." First-class goatskins come from the Cape of Good Hope, and are known as "Levant Cape Goat." When the grain of Levant morocco is crushed until the surface becomes smooth and polished, it is known as "Crushed Levant." Switzerland and Germany supply large quantities of goatskins of good quality, which skins are used to a large extent for art bindings; these are finished "bright" with a straight grain.

MOROCCO.— This leather is goatskin, tanned with sumach and dyed. It gained its appellation because it was originally brought from Morocco; it was afterward brought from Turkey and other parts of the world. It has a much coarser surface than sheepskin, the fibers are longer, and it is one of the strongest skins used for bookbinding. "From the sixteenth to the end of the eighteenth century, specimens of red morocco are found to be least changed by the various conditions to which they have been subjected. The morocco retains its flexibility and color to a remarkable extent, keeping a hard surface that is not easily damaged by friction. It is believed that most of this leather was tanned with sumach or some closely allied tanning material."

Books bound in morocco are more attractive than when bound in other leathers, and it should be used on periodicals which are in frequent use, as well as on all valuable or artistic books.

OASIS MOROCCO.—African goat or antelope skins of originally pure tannage are enriched by a sumach dressing, and are called "Oasis Morocco." These skins are not dyed in light or delicate colors, but in serviceable shades, and special attention is given to fastness of color to light. As these skins are guaranteed to be free from all inju-

rious acids, and their price is moderate, being as cheap or cheaper than Persian morocco, they provide a very satisfactory material for bookbinding.

RUSSIA.— This leather was made in Russia from the hides of young cattle and tanned in willow bark. It is now made in different countries from horsehides, calf, goat and sheep skins. Originally the skins were colored red by surface dyeing with sandal wood, but are now prepared in other colors. Black is obtained by staining the skins with acetate of iron. The pleasing odor is obtained by saturating with birch tree oil. Leather now sold as " Russia " is not durable.

COWHIDE.—American cowhide is a better material than the russia, and is widely used in the United States on blank and account books, for which durability is the prime requisite. The leather is made from cow, steer or large calf skins tanned in birch and bark. A similar leather is made from dark-tanned calfskins, which are scented in the finishing processes with birch-tan oil to give the russia leather odor. It is not as tough and durable as pigskin, which is winning favor with blank-book manufacturers. It should be used on periodicals and heavy letterpress books. Gas and heat tend to dry up this leather in from five to ten years; hence, it should be frequently livened up with vaseline, or as described under " Preservatives." Dishonest binders are prone to substitute cowhide buffings.

BUFFINGS.— The thin grain portion split from cowhide is known as " cowhide buffing." This is not as strong as the coarser grain of cowhide, and should only be used for novelty work. It is frequently mistaken for cowhide or russia.

FLESHERS.—When sheepskin is split, the under side is called " flesh " or " fleshers." This leather, when dressed, is called " chamois." Because of the color combinations on full-bound russia ends and hubs, this finds favor in

blank-book binding. The decorating is done by branding, which tends to weaken the leather.

PERSIAN MOROCCO.— Genuine Persian morocco is strong, and made of the skin of a small, hardy goat abounding in Persia and the East Indies. The term "Persian Calf" is a misnomer, as this leather is made from the skins of the hardy mountain sheep of Persia and the East Indies; the skins merely resemble calf by their smooth surface. Although Persian morocco should not be used for books intended for permanent preservation, it may be usefully employed for the lending library books which will be subjected to hard wear, and are, as a consequence, expected to last only for a few years. The grease that is imparted to the leather by the handling of the books tends to preserve the leather.

BOCK OR PERSIANS.— East Indian goat and sheep skins, after being tanned, are largely imported. Many of the skins are from animals that have been cross-bred. They are roughly tanned by the natives with turwar bark, a tanning material belonging to the catechol group, which is strongly condemned by the Society of Arts Committee. East Indian or Persian tanned sheep and goat skins are suitable for cheap bindings. Books bound in these materials have been found to show decay in less than twelve months, and one is inclined to believe that "no book bound in these leathers, exposed on a shelf to sunlight or gas fumes, can ever be expected to last more than five or six years." After the skins arrive, they are detanned to get rid of the turwar bark tanning, in which process the natural grease is removed, and they are bleached by being treated with sulphuric acid. They are then retanned in sumach, or a combination of sumach and oak, and dyed in the ordinary way, frequently with the addition of acid to the dye bath.

SHEEPSKIN.— This leather, if properly tanned, would be useful for certain classes of books because of its pliability. The fibers are fine, and their tensile strength is

not great. Its durability is testified to by the good condition of books bound in this material about a century ago. Sheepskins are obtained from all parts of the world, and they vary in quality and durability. There is a great difference between the skins of the hardy mountain sheep and the sleek, well-fed and securely-stabled sheep of the plains; the fiber of the latter is much looser, and the leather less tough. The high-class wool sheep makes the poorest leather.

SKIVER.—When sheepskin is split, the upper, or grain, side is known as a "skiver." Skivers have very little strength, as their fibrous structure is destroyed in splitting. This leather is generally finished by "printing."

"Paste Grains" are skivers which have been "pasted" on the flesh side with a size of glue jelly. These leathers are utterly useless for letterpress bindings, as their strength is no better than tough paper. Novices are unable to distinguish between this and sheep, and to a great extent, dishonest binders have substituted it for sheep.

GRAINS.—All leathers have their own natural grain, which may be made more conspicuous by graining. Morocco leather is distinguished by the numerous small prominences on the surface of the skin, and the variation in the size of these when the leather is finished provides "bold grains" or "fine grains." The final size of the grain depends upon the thickness and flexibility of the skin and the manner in which it is grained.

The graining of leather by hand is effected by pushing or pulling a fold in the skin with the aid of a flat piece of cord, which grips that portion of the skin with which it is in contact. The method of graining a skin determines whether it shall be a "straight grain," a "cross grain," or a "long grain." The grain does not increase the toughness of the leather, but renders it pliable, supple, and enhances its appearance. The beautiful appearance of a bold grain is fascinating, but it tends to provide a har-

boring place for dust and deteriorating agencies. Small-grained morocco will best meet the requirements of library bindings.

IMITATIONS.— Modern sheepskin is generally rendered worthless by the objectionable practice of embossing or printing the leather to give it an artificial grain in imitation of the characteristic grain of morocco or others of the finer or more expensive leathers. This deception has a very injurious effect on the leather, as it greatly impairs its strength and durability. No leather should be purchased which is not correctly described. "Since about 1860, sheepskin as sheepskin is hardly to be found. Sheepskins are grained in imitation of other leathers, and these leathers are generally found to be in a worse condition than any of the other bindings, except, perhaps, some of the very thin calfskin."

Sheepskins are tanned in different ways and with various tannings. When tanned in oak or birch bark, it is known as "Basil." It is distinguished from Roan, which is a soft and flexible sheepskin tanned in sumach and stained or colored.

ADULTERATIONS.— Chief among leather adulterants is glucose, obtained from corn starch. The glucose is applied either by brushing it on or by putting it with the leather into a revolving drum, the object in either case being to add weight. It should be remembered that much leather is sold by the pound, and when loaded with ten per cent of its weight in glucose, it brings a more satisfactory profit. Unfortunately, the effect of such treatment is to make the leather more penetrable to dampness, and hence, to impair its wearing quality and shorten its life.

Another common adulterant of leather is Epsom salts, which is alleged by those who use it, to "clear the grain" and render the material brighter. Any such effect, however, is slight, and the treatment is very harmful, destroying the damp-proof quality of the leather. Here, again,

the object in view is to add weight, which may be augmented to the extent of ten or twelve per cent.

Yet another method adopted consists of putting into the leather a large excess of tanning material, which comprises tannin and related compounds, sugars and organic acids. By this means twenty per cent may be added to the weight. The effect of the treatment is to make the leather more water-resistant at first, but the superfluous tannin, etc., soon wash out, so that there is no real gain in that respect, while the material is rendered harder, stiffer and more likely to crack in bending.

FABRICS MADE IN IMITATION OF LEATHER.

The large consumption of animal hides in the production of leather has necessarily led wide-awake manufacturers to endeavor to produce a textile fabric equal in strength and surfaced in a manner not to be distinguished from the genuine leather. These fabrics are made under different names, such as Texoderm, Imcur, Fabrikoid, Pluviusin, Keratol and Rexine. Many supply houses give them special names, such as " Ganette," sold by Messrs. Gane Brothers & Company. These materials are treated on the surface with special preparations in different colors in imitation of grains of different leathers. They are water and stain proof, and should find favor for school books, as they can be cleaned and disinfected. The common complaint is that stamping and hand finishing are difficult when compared with leather or cloth. The difficulties encountered in finishing have been described under that head. That the pasting of labels to the surface can not be accomplished without first removing the surface by scratching, is surmounted by using a suitable glue for the purpose, as described in the chapter on " Glue." The surface should be washed with alcohol or ammonia and allowed to dry before placing the glued label on the surface. Many of these materials are cheaper and superior to the cheaper grades of leather,

and some of them have stood severe tests in tropical countries with Croton bugs, and have been found to be immune from attack.

CUTTING LEATHER.

To ascertain the width of the leather on the board of letterpress or half-bound blank-books, divide the width of the board into five equal spaces; one-fifth is the width

plus one-fourth of an inch for paring. This also is the width of the corner; from the edge of the corner to the center of the outer edge of the corner should be the same as the width of the leather back on the board with five-eighths of an inch turn-in over the edge of the board. The length of the back for letterpress books is cut one and one-half to two inches longer than the length of the boards, according to the thickness of the board. Take a strip of paper, and measure from the one-fifth on one side of the board over the back to that of the other; to this add one-half of an inch for paring the ends.

On three-quarter-bound blank-books, the size of the back and corners is determined by dividing the width of the board into five parts; then, with a piece of paper, measuring across the back from one division mark to another, and to this adding one-half of an inch for paring, and four inches to the length for turning-in and setting heads.

The leather for full-bound blank-books is cut four inches larger than the open book. This allows two inches for turn-in over the edge of the board. On full-bound ends and hubs, cut the leather three inches larger than the open book. This allows one and one-half inches for turn-in over the edge of the board on the front, and ample surplus material to work in the leather close to the hubs from the ends. The cowhide ends are cut to cover both

sides and back from the hub with one-and-one-half-inch turn-in over the edge of the board. The cowhide for the center is cut the distance between the hubs, and extends one-third the width of the book plus the width of the joint on the side.

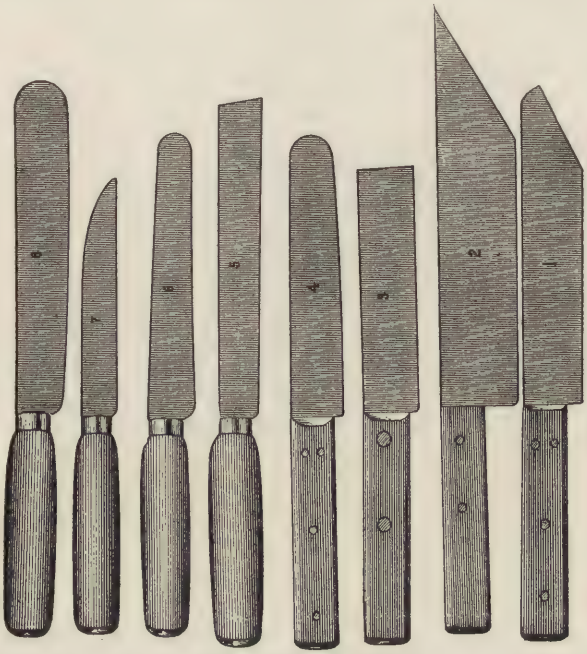
Cut a piece of binders' board, according to these dimensions, for a pattern; then place the pattern on the skin of leather in such a way that the grain or fiber will run across the width. This is essential when leather must be worked in close to a band or hub. If the fiber or grain runs the length of the back, it is difficult to work in.

The corners can be cut as convenient, unless the leather has a prominent straight grain, when it ought to conform to the back.

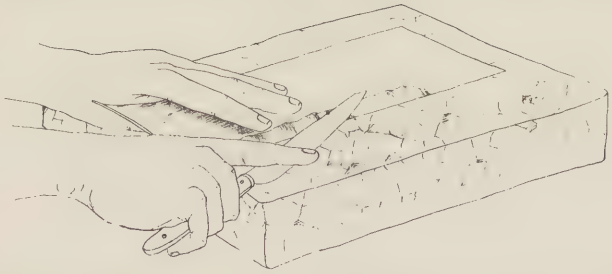
PARING LEATHER.

All leather must be pared along the ends, so as to give it a smooth finish on the boards. The depth varies according to the character of the work. Letterpress books will require about one-eighth to three-sixteenths, while blank-books about one-fourth to three-eighths of an inch, according to the thickness of the leather. If the leather is unusually thick, then the ends which turn in over the head and tail must be pared to give a neat head. Care must be taken in this, as too much paring will weaken the leather. The small ends of the leather corners for rounded boards are pared wider than for square-cornered boards to enable a neat turn-in, so that the edges may be covered by the end-leaves in the finished book. On books which are sided with moleskin, canvas, or corduroy, the leather ends must be pared even, as otherwise they would be unsightly. It is a mistake to paste leather on any of these materials without paring, as the leather peels up after a few months' wear. Pare five-eighths of an inch on the ends, so that in trimming the leather in the final operation a portion of the pared edge is visible on the board.

For hand paring, a sharp knife and a flat stone or glass are indispensable. Tough, fibrous leather must be dampened with a sponge or by taking a lot and sticking



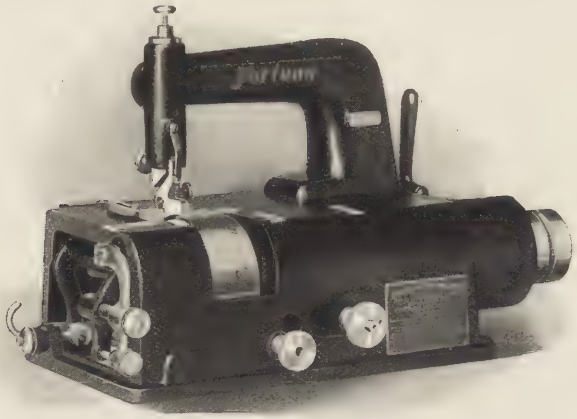
the narrow ends in water and rubbing the edge. Place the leather on the stone, hold the paring knife with the



right-hand index finger on the blade, place the knife on the edge of the leather, the handle close to the stone, and then gradually push the knife forward. A smooth, even

pare must be obtained, as on half-bound or three-quarter-bound books the cloth is placed on the pared edge and would otherwise look unsightly.

PARING MACHINE.— This machine is designed to pare leather any required width within the scope of the foot above the feed roll. The feed roll should always be close



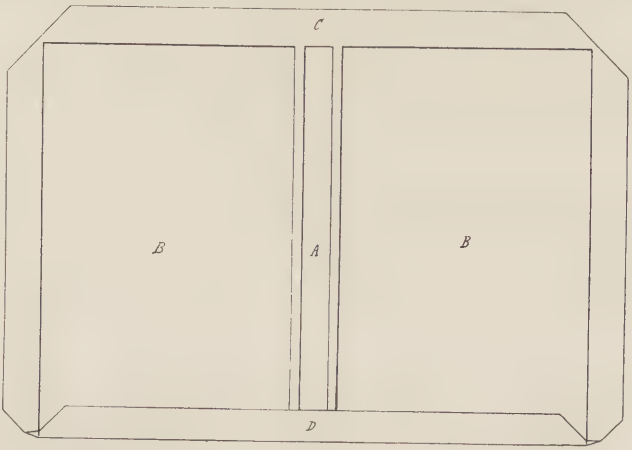
Fortuna Skiving Machine.
(Gane Bros.)

to the inside edge of the circular knife, but must not touch it. The foot should be regulated so that the back end is about one-half the thickness of the leather to be pared, from the feed roll. The width of the pare is regulated by the screw back of the foot. Feed the leather close to the guide from left to right under the foot; the feed roll will advance the leather until the entire length is pared. A clean even pare is only possible with a sharp knife, and this can always be kept in good condition with the emery wheel, which is a part of the machine. Too much pressure on the knife by the emery wheel will burn it.

MAKING CASES.

CLOTH, BUCKRAM, OR IMITATION LEATHER CASES.— The first operation in case-making is to determine the width of the back, or the space between the boards. To

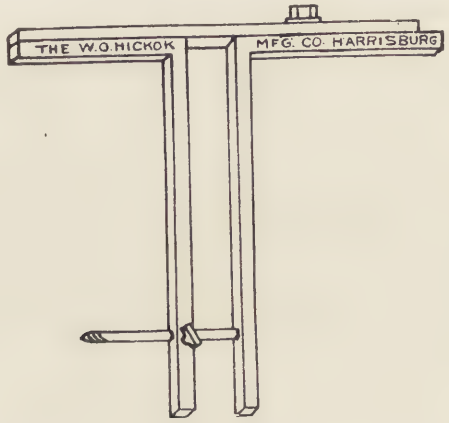
do this, take two boards which have been cut according to previous direction, and, with the index finger, apply a little glue on the center of one end. Place the board on the book, with the glued end toward the ridge of the back, allowing about one-eighth of an inch space for the joint, in which, in the final pressing, the brass strips of the boards are inserted. Then put under a weight, and leave to dry. A strip of paper about four inches wide is tipped on the one board, then brought over the back, and tipped on the other board. The boards are then torn off the book, and the case gauge is adjusted to fit the space between the boards. Measure the length and the width of the boards plus the space between them and one and one-fourth inches for turn-ins over the edge of the cover.



A — Manila paper. B — Boards. C — Cloth. D — Turn-in.

A five-eighths-inch turn-in is all that is required, and more will be unsightly as well as wasteful. Having ascertained the size, cut the cloth so that the grain will run the length of the back. Measure the size on the right edge of the cloth, and allow one-fourth of an inch for trimming; slit the cloth; bring it over; and fold it even on the sides at the slit. Then place the knife between the cloth, and

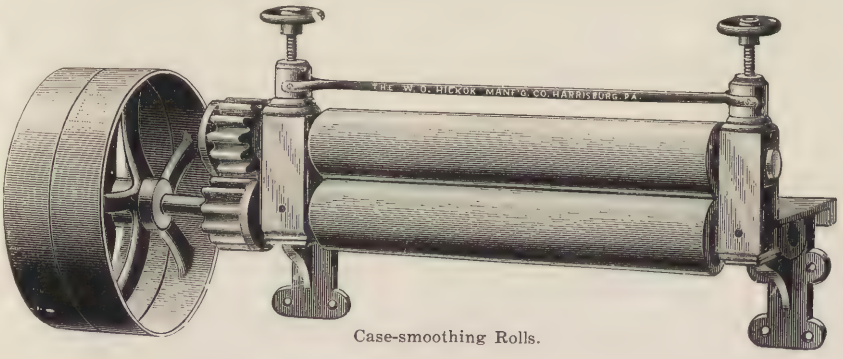
cut apart in the fold. This is continued until the entire amount is cut, when it is taken to the cutting machine and cut to the exact size required. The cloth should be laid with the right side down and glued together about one-half of an inch in the center on the left edge. The glued end is placed opposite the worker when gluing the surface of the cloth. Then place the boards, which are held



Case Gauge.

together by the strip of paper on to a piece of the cloth, and cut off the four corners, so that a slight portion can be turned over the corner edge of the board. Place this on the pile, and square in the cutting machine; then cut. All four corners are treated in the same manner. A piece of manila or gray rag paper is cut the length and the width of the convexed back of the book. Place the cloth on the right end of the bench on a waste sheet of paper, and the glue pot to the right. A wooden board, on which four or six pieces of burlap have been placed and saturated with water, is placed to the left of the cloth on the bench. The case gauge is laid on this when not used, which prevents the glue from adhering to the sides. For this purpose, the glue should not be of a quick-drying variety, and a flexible glue is preferable to the ordinary

glue. Glycerine, mixed with the ordinary glue, will prove beneficial, as it prevents quick drying. The glue is spread on the cloth first from and then toward the workman, rubbing the brush off the cloth. Remove the piece, and glue another; repeat this with three or four pieces; then lay the left board on so that five-eighths of an inch turn-in projects. Pick up the case gauge with the right hand and place it on the cloth even with the edge of the board. Then lay the right-hand board on the cloth close to the gauge even at the head. Take the strip of paper, place it between the boards, and then take the turn-in steel, placing the edge under the cover and folding the cloth over to fit snugly. Turn the cover around and turn over the projecting cloth of the tail end; then, with the corner of the steel, the edge of the cloth is folded in and the edges of the corners are covered. Then place the turn-in steel under the edge of the board, and fold over the cloth of the front edge of the right-hand board. Turn the cover around and repeat the turn-in operation of the front edge of the other board. The cover is then turned over and rubbed down with the turn-in steel.



Case-smoothing Rolls.

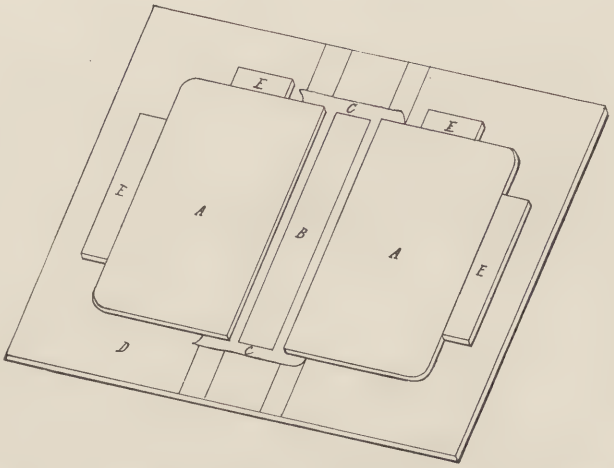
To facilitate this operation, two or three people are employed to make cases; one to glue, another to lay on boards and paper and assist in turning-in, and the third to turn-in and rub down or run the cases through the

wringer. Considerable time is thus saved, and better results are accomplished. The case-smoother, as shown in the illustration, is frequently built in a bench and operated with power. This is an advantage which should not be overlooked by manufacturers who have any great amount of case work.

HALF-BOUND CASES.— The boards are cut as described in the chapter on " Boards," and, if round corners are desired, the operation is performed on the cornering machine. Cut a piece of manila or gray rag paper the width of the back and the length of the book. Cut and pare the leather as described in the chapter on " Cutting and Paring Leather." Should the leather be stiff, wet it with a sponge, or take a lot and stick the narrow ends in water and rub the edges. This will render it pliable and easy to turn over the edge of the board. Then paste the leather corners, laying two pasted corners together. Enough should be pasted ahead so that those pasted first will be tacky. Lay two leather corners on the boards in such a way that one-eighth of an inch of the leather will project above the corner edges. This is tucked in with the thumb-nail or folder after the sides have been turned over on the board. Then rub a little paste on the turned-in edge of the leather, and bring the projecting leather over the top edge of the board. Rub down with a folder and continue the operation.

When all the leather corners have been put on, tip two boards on to the book, then glue the end of a strip of paper to one board, and extend over the back and glue on to the other. Remove the boards by tearing the tipping. Cut a piece of binders' board about six inches larger than the open cover. Place the open book boards on this board, and glue a strip one inch wide at the head and fore edge of the boards. Mark the position of the leather back on the gauge board just made, then paste the leather back with a thick paste, and lay the pasted sides of two together. When a sufficient number have been

pasted so that they are tacky, lay one on the board gauge in the center, and place first the left board and then the right against the strips. Lay the manila or gray rag paper in the center on the leather, and turn the projecting leather ends over the edges of the boards, then rub down



A — Boards. B — Manila paper. C — Leather back (turn-in). D — Gage board. E — Gage-board blocks.

with a folder. Repeat this until all are made, laying the covers so that the leather backs come together. The next operation is siding.

HALF-BOUND CASES WITH BANDS.— Cut the boards, manila or gray rag paper, leather back and corners, and pare the leather as described under their respective heads. The gray rag or manila paper is divided according to the style of band desired, as described in the chapter on "Bands." If the number of cases to be made justifies it, the paper may be ruled to indicate the positions of the bands. This will save the time of measuring the backs with dividers. Cut the soft twine or leather the exact width of the back, and lay the pieces in thick paste. Take out one at a time and lay on the paper above the division marks; this must be carefully done, and if twine is used,

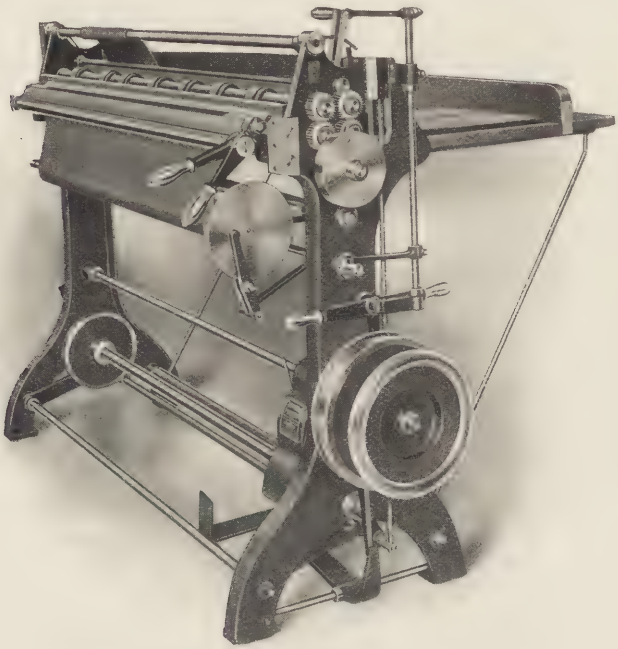
it should be rolled before laying it on. When this is done, lay them aside to dry. Then paste the leather backs, and conclude the entire operation as described under the preceding chapter. Care must be taken to lay on the paper with the bands on the leather even with the top edge of the boards, so that all will be uniform. Should a cap be desired to cover the head-band, lay a piece of binders' board the width of the back on the turned-in leather one-eighth of an inch from the edge, and bring it over with a folder close to the edge of the board even with the book boards. Then turn the cover over and rub up the bands with a grooved stick. The rubbing-up can best be executed if pieces of binders' board the exact width of the back are put in the bench press or backing machine and the case laid on. This will enable a straight, snug crease to be made on the leather the width of the back only. Rub down between the bands with a folder and lay aside. The next operation is siding.

FLEXIBLE OR LIMP CASES.— The covering material is usually leather, but frequently Texoderm or an imitation leather is used. These latter materials have an advantage in that they are water and stain proof, and the surface will outwear the cheaper leathers, such as roans, buffings and skivers. There is a drawback in turning in round corners, as the material is stiff, and being a linen fabric, can not be pared. In place of boards, gray felt paper is used; this is soft and pliable and an ideal material for loose or flexible covers. Cut the gray felt paper one-fourth of an inch narrower than the width and one-eighth of an inch longer than the length of the book. If round corners are desired, the operation is performed on the cornering machine. The leather, or whatever covering material is used, is cut to allow five-eighths of an inch turn-in over the edge of the felt paper. All leather used for flexible or limp loose covers should be shrunk to obtain a flat-lying cover, or dampness in the subsequent operation will stretch it, thus producing a wrinkled-

looking cover. To shrink leather, take a sponge and clean water and wet slightly on the wrong side; then lay on top of each other. The leather should be placed between pulpboards and left to dry. If the material is of delicate colors of calf or morocco, then place the pieces between sheets of clean paper to avoid iron or rust spots. The leather may be taken out of the boards the next morning and exposed to the air for several hours. Take two pieces of the felt paper, tip on the sides of the book three-eighths of an inch from the edge of the back. Thus, one-eighth of an inch for the front and one-sixteenth of an inch for the head and tail squares are obtained. Pare the leather as described in the chapter on " Paring Leather." Then place a sheet of waste paper three-sixteenths of an inch from the back edge of the felt paper, and glue with the fore finger; repeat this on the other side, but do not lay the glued side on the table. Lay the book on the covering material so that five-eighths of an inch turn-in will remain at the head, tail and fore edge; turn the book over and bring over the material; then stick to the other side. Remove the cover and set the case gauge the distance between the boards. Fan out the gray felt paper three-sixteenths of an inch on the edge which comes nearest to the back edge; then paste or glue; lay one on the left end of the covering material; then place the case gauge against the head and side edge of the gray felt paper. Pick up another, and lay this with the glued edge against the gauge. Repeat this until all are finished. As all flexible cases are tight-back, no paper is required between the gray felt paper sides, as the leather is glued or pasted to the back.

The paring of the corners is done after the felt paper is tipped on, as it permits of a more accurate pare. Some binders prefer to pare entirely after the gray felt paper has been tipped on the leather, as it enables the leather to be straightened by paring when the sides have not been tipped on straight. Make a paste gauge; that is, cut a

piece of tin or binders' board the exact length and width of the open sides, with a handle in the center. Apply a medium-thick paste on the turn-in ends, and lay the covers with the pasted portions together. After a sufficient number have been pasted so that the first are tacky, turn in the ends, first the sides or head and tail, then the fore edges. Round corners must be worked in or the leather doubled together and pressed down with the folder.



Smyth Cloth-cutting Machine.
(E. C. Fuller.)

Square corners have about one-eighth of an inch of the covering material tucked over the corner edge of the boards and the fore edges turned over the edge of the gray felt paper. The next operation is stamping the covers.

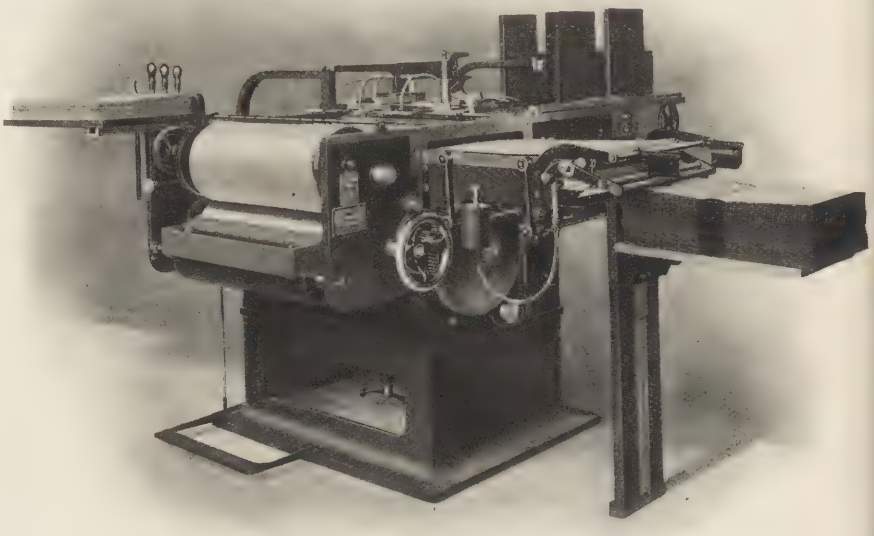
CLOTH-CUTTING MACHINE.— This machine is designed to carry a roll of bookbinders' cloth of standard length

and diameter. A second style machine is designed to take a roll of material larger in diameter than book cloth, and to cut rectangular sheets as large as the full width of cloth by thirty-six inches. This machine has many advantages over the hand-cutting process. It will cut a roll of cloth into rectangular sheets in a fraction of the time required by hand. It not only saves the labor of rerolling the cloth, but the uniformity in size of the covers cut by the machine and the removal of the curl of the cloth facilitate the operation of the case-making machine. It will cut book cloth, crash, canvas, duck, and similar material coming within the range of the machine.

The cloth, as it is unwound from the roll and fed into the machine, passes around the edges of a straightening bar acting in connection with an adjustable friction plate by which the curl of the cloth is entirely removed before coming into contact with the slitting and cross-cutting devices. The cloth is slit longitudinally by circular knives adjustable transversely of the machine. A vertical reciprocating blade cuts the slitted cloth into blanks of the desired length. The cloth is advanced at intervals by intermediary rotating feed rolls, the amount of feed being determined by the period of rotation of the rolls, which is controlled by a simple adjusting device. As the sheet is drawn into the machine by the feed rolls, the rotary knives slit it into strips. During the interval of rest of the feed rolls and rotary knives, the reciprocating blade is brought into action by cams, and shears the strips into rectangular sheets, which are delivered upon a receiving table. The surplus is compactly rerolled in a continuous strip.

CASE-MAKING MACHINE.— This machine is designed to make cloth or half-bound cases. These can be made with or without back lining, and the backs kept dry and free from glue. Bevel-edged cases can be made on all machines. They are designed for short, as well as long, runs. The adjustments are easily and quickly made, and

fifty cases can be economically handled. On half-bound work the backs and back lining can be attached to the boards on the machine in one operation, and if desired, the book may be sided up also on the machine. The siding-up device can be supplied, thus completing the half-leather work, except putting on corners.

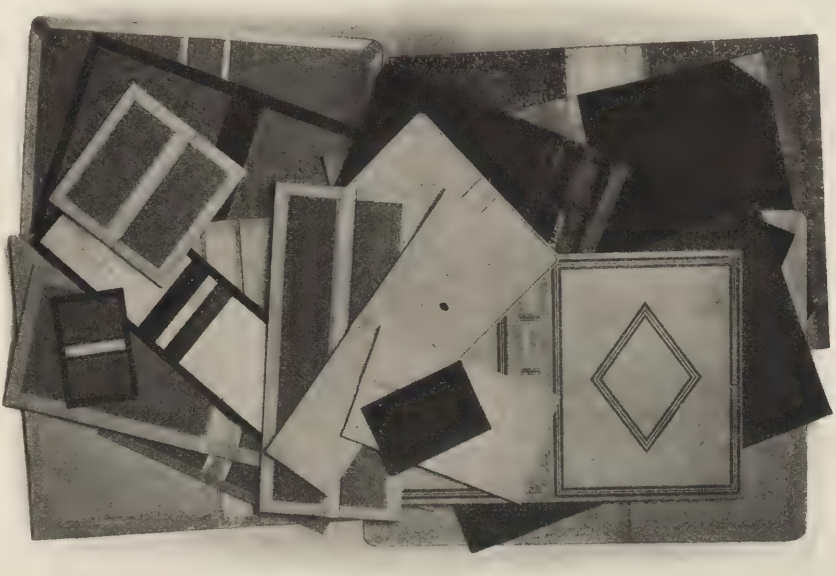


Smyth Case-making Machine.
(E. C. Fuller.)

Special machines are made to order which will attach leather corners and turn in round corners on drilling, canvas, or flexible material.

The boards are placed in magazines at the rear; the glue is heated and is in a tank underneath the front of the machine. The back lining is in a roll. At the rear of the machine, the cloth or other material to cover the cases is cut the required size, the four corners cut off and placed

on a feed table at one side. The operator stands at the front of the machine and feeds the cloth or other material to gripper fingers on the cloth cylinder. This cylinder revolves; the cloth or other material is brought into contact with the glue roll and is coated with glue. A cloth carrier, provided with grippers, carries the cloth forward, glued side up, and on to a platform. The bottom of each pile in the magazine at the rear is withdrawn and posi-



Samples of Covers Made on Machine.

tioned on the glued surface of the cover fabric. If back lining is to be used, it is fed and cut to the exact length, then placed between the boards. The head and tail turn-in of the fabric is folded over the boards at the same time the corners are nicked in. Then the second folding bars fold the fabric over the fore edges.

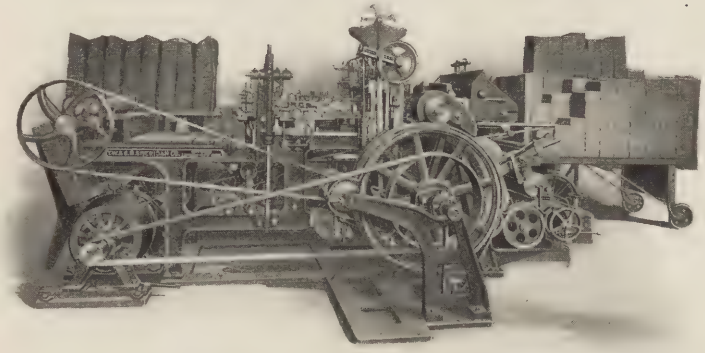
The case is discharged into a finishing press provided with water-bag bed, where it remains under an even pres-

sure over its entire surface during the progress of the next case, upon the arrival of which it is delivered on to a receiving board. The whole operation, except the feeding of the cover fabric, is automatic. The water pressure finishing in no way disturbs the original finish of the cloth, and insures perfect adhesion of the cover fabric to the board. The gluing mechanism is adjustable, so that fabric with open mesh may be used without danger of the glue striking through the finest silk finish.

These machines are made in two sizes: the No. 1 machine will handle a case 5½ by 7½ to 9½ by 15 inches. With an attachment, cases as small as 3¾ by 5½ inches can be made. The speed of the machine approximates seven hundred cases per hour. The No. 2 machine is designed for larger work, and will average five hundred and fifty cases per hour from 7 by 11 to 14 by 22 inches. With an attachment, cases 7 by 7 to 7 by 11 inches can be made. A special machine with a round-cornering attachment is made, which has a range from 7 by 7 to 16 by 22 inches.

A different style machine, although somewhat complicated and more difficult to adjust, will average one thousand cases per hour. It is, obviously, a machine made for long runs, and will make cases 8¼ by 5½ inches up to 17 by 11 inches. The cloth is cut into rolls the width required for the case, and a machine to slit and rewind the cloth is furnished with each machine. The roll is placed in the machine with the reverse side coming in contact with a cylinder which revolves in a tank of glue, and the cloth is thus coated with glue. The boards are cut to the right size, placed in the machine, and fed in pairs simultaneously from a magazine hopper. The boards are placed in correct position relatively to each other and to the successive pairs, in order to provide the right amount of cloth for turning in. The fabric carries the boards between rollers, presses them and gives them a forward movement. A knife, provided with a V-shaped

cutter at each end, cuts the cloth between the boards the correct shape for turning in. If the cases are to be loose-back, it is fed in correct lengths from a hopper, and the advancing edges of the cloth are turned over the edges of the boards, then pressed by rollers. The rear edges are then turned over, and pressed down. Another roller passes between the two boards to press the back lining to



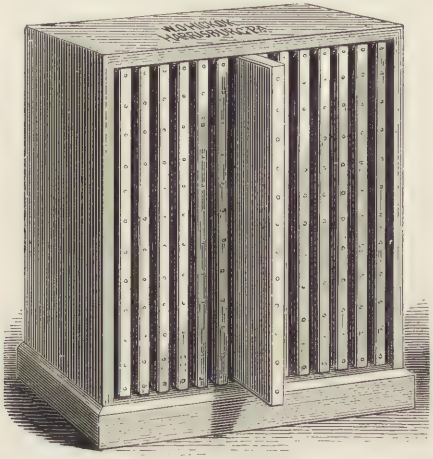
Sheridan Case-making Machine.

the cover. The side turn-ins are then turned over, and pressed by rollers. The case is then delivered in a trough, and passed through a case smoother.

CASING-IN.

All covers which are made off the book are termed "cases," and the fastening of the book into such a cover is termed "casing-in." The books are ready for cases when the backing, head-banding, and lining are completed. The covers are rounded on a steam pipe by placing the outside of the boards together, and holding the back space against a hot pipe. Place the books with the tails toward the body, the paste box to the right, and the cases to the left with the head toward the body. Prepare the press and brass-bound boards; then apply a medium-thick paste to the front end-leaf, lay it on the cover, so

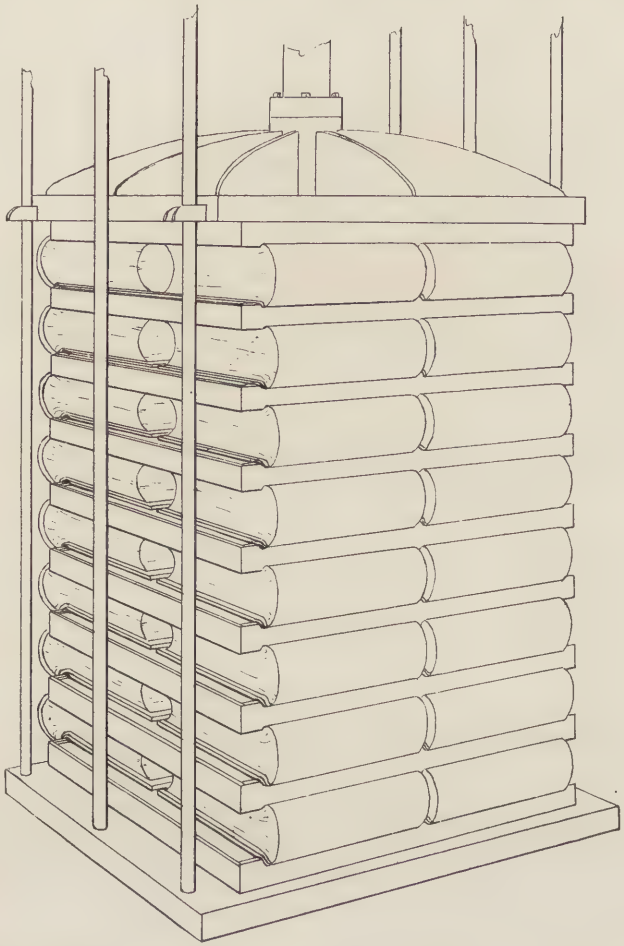
that the head and tail squares are the same and the front a trifle larger. Then paste the back end-leaf while the book is resting on the pile of covers, and lay aside. Place the right hand between the book leaves, and with the left hand bring the other end of the cover over and adjust the squares. The cover must be pulled tightly over the



Brass or Aluminum Bound Casing-in Boards.

book, and laid aside with a weight on top to prevent it from slipping and becoming loose. Nip every ten books in the press with the backs out. Repeat this for about one-half hour, then lay the books between brass-bound boards about one inch from the backing ridge, and give a slight pressure. The boards must be absolutely even on one another; this may be brought about by placing the edge of a large board against the brass edges and pushing them against it. The slight pressure of the press prevents the boards from shifting, and at the same time enables the forwarder to push the books in so that the brass edge will fit the space between the board and backing ridge of the book or joint. Care must be taken to avoid pushing the books in too far between the boards. This mistake can be easily detected by running the hand

across the back with the thumb and fingers along the ridges. Press firmly and proceed with another lot of books in the same manner. After a firm pressure of one-half hour the press should be loosened to prevent the

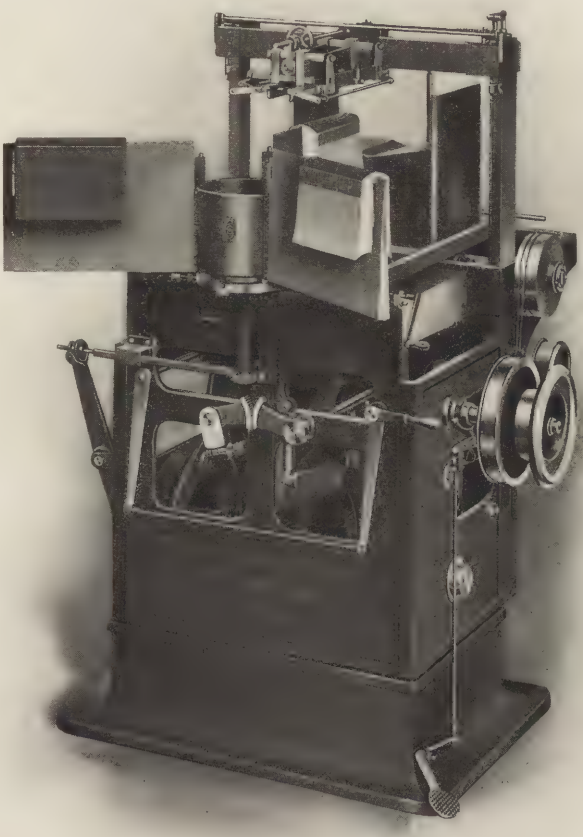


brass-bound boards sticking in the joint. The greatest care must be exercised in pasting the sides, as too much paste in the joint will cause the books to stick to the

boards. The books should remain under pressure over night; hence, it follows that this operation should be performed near the close of the work day. Thin end-papers and thin paste will not allow the book to slide to enable the adjusting of the squares; hence, should be avoided. Glue should not be used for this purpose. This operation is best accomplished by two, the one pasting and the other adjusting the squares and fitting the book in the case. The books are taken out of press the next morning, and examined. If the fly-leaves stick to the boards, separate them by placing a folder between them and the boards.

CASING-IN MACHINE.— This machine is designed to case in books; that is, to securely fasten a book in its cover. It is provided with three radial feed arms, on which the books are placed; a magazine, from which the covers are fed; a pair of paste boxes provided with rollers and a jointing-in device. The operator stands at the right of the machine, and places a book on one of the radial arms to a gauge. The arm makes a third of a revolution, and brings the book into the center of the machine. This arm then descends to its lowermost position. Then a case is fed from the magazine to a position directly over the book. The two paste boxes come up tightly against the book, the arm raises slightly, and the jointing-in device, which is over the book, firmly clamps the cover to the book at the joints. The arm and jointing-in device then rise, the book is drawn between rollers carried by the paste boxes, and when it has risen to its high position, clamps come down on the outside of the book and firmly press the cover to it. The arm then makes another third of a revolution, and the book is removed. The arm carrying the book in process detaches itself from the arm-carrying drum during the process, leaving the two remaining arms in a stationary position for the operator to put another uncased book on one and remove the finished book from the other. Thus, at each third of a revo-

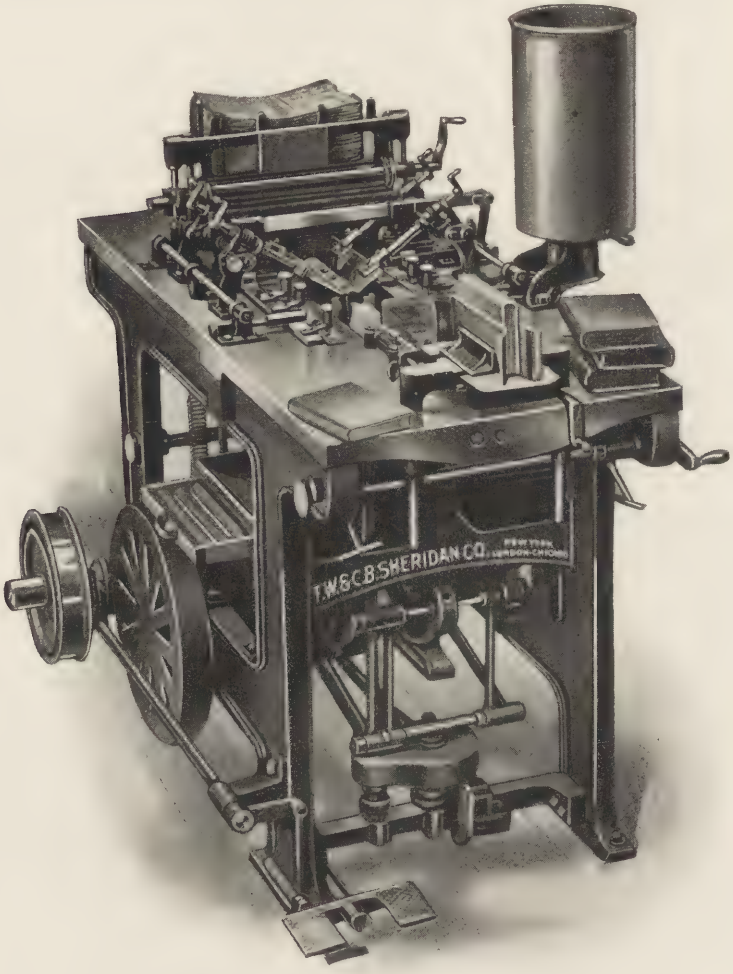
lution of the arms, a book is cased-in. A double quantity of paste is applied to that part of the book covered by crash and in the joints. The pasting is perfect, and no surplus oozes out around the edges. The jointing-in device fits the book in the cover, and draws it on tight



Smyth Casing-in Machine.
(E. C. Fuller.)

across the back. This machine will average five hundred books per hour, and adjustments are quickly made.

Another style machine adjusts the book into the cover without opening it up. The book is pushed forward by hand on to the book blade; the knife edge enters the



Parkside Casing-in Machine.

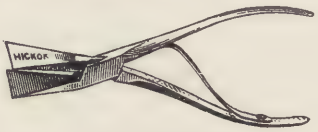
middle of the book. The book is then automatically placed in correct position on the blade. The book blade has a pendent extension situated above a paste tank. As the blade descends, the pendant extension dips into the tank. The pasting device consists of a pair of plates, one on each side of the blade, timed to move in and out as the book blade rises and falls. When the blade is at its height, the pasting plates advance into contact with the pendent extension, which has just emerged from the paste pot and has risen between scrapers to remove the surplus paste. One set of scrapers regulates the amount of paste, and the other removes the paste at the head and tail of the book, which prevents the smearing of book edges. As the pasting plates recede, the book blade descends, and when its lowest position is reached, the paste is applied by the advancing plates to the sides. The cases are in a hopper at the rear of the machine, and are drawn out from the bottom one at a time and fed on to a rounding and joint-forming device. The case is then advanced above the book. The book descends and enters the case, then is removed from the blade and laid aside. An average of seven hundred and fifty books per hour is claimed for these machines, and adjustments can be made in from six to ten minutes.

COVERING LETTERPRESS BOOKS.

The cornering of the book, if such be the style, always precedes the drawing-on of the leather back. This is done by wetting the heads of the leather corners, which have been previously cut and pared, as described in the chapter covering these operations. Apply a medium-thick paste, lay the pasted sides together and paste enough so that the first ones will be tacky. Then place the leather on the board corner ends in such a way that one-eighth of an inch of the leather can be tucked over the edge of the corner. Turn over the projecting sides of the head and tail with the thumbs, and tuck in with both thumb-nails

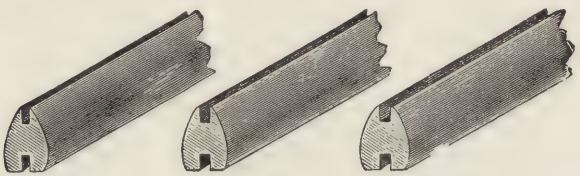
the projecting leather over the corner edge. Then rub a little paste on the turned-in edge of the leather, and bring the projecting portion of the leather over the fore edge of the board. With a folder, rub the leather snugly to the board. Round corners must be worked in or the leather doubled together and pressed down with the folder. Then place tin, zinc or boards between the board and the end-leaf to keep the dampness out of the leaves. When dry, remove them and put on the leather back.

Take the leather which has been cut and pared as previously described, and wet the ends by dipping in a

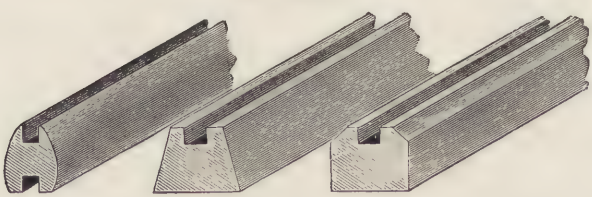


Band Nippers.

pail of water and rubbing; this will make them soft and pliable, and enable setting a neat cap for the head-band. A sponge and water may also be employed, provided the sponging is just enough to dampen and not saturate the



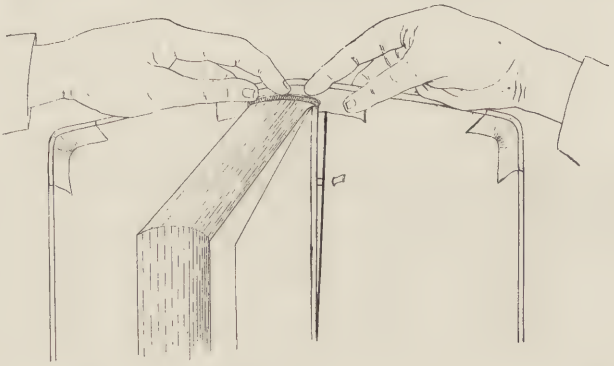
Band Sticks.



leather. Apply a medium-thick paste on the leather. Put the pasted sides of two pieces together, and paste as many as can be finished in a reasonable length of time or before

the paste gets dry. Novices will, of course, not be able to finish more than three, while experienced workers can take six or more. This, of course, depends on the size and thickness of the book. The book is opened, and with a sharp knife the ends of the back lining are cut in the fold at the edge of the back about one and one-half inches to permit the leather to be turned over the edge of the outer portion of the lining. Separate two pieces of leather, and lay a book on, allowing equal turn-in at the head and tail and the requisite amount on the side. Bring over the other end of the leather, at the same time pulling a trifle. Then rub up the bands with a grooved stick. Care must be taken so that the leather on the boards is straight, as otherwise, in the siding operation it will look unsightly. If high bands are used, as is usually done on morocco books, it may be necessary to employ band nippers to press the leather in on the bands and correct irregularities of the bands. However, a band stick with grooves will answer in nearly all cases.

Throw back the boards, and holding the book with the right hand, place it on a paring stone so that the boards



and head-bands are free. The fore edge is against the breast, the fingers of both hands are on the outside, and the thumbs on the inside of the boards near the backing ridge. Place the thumbs on the leather back on the board

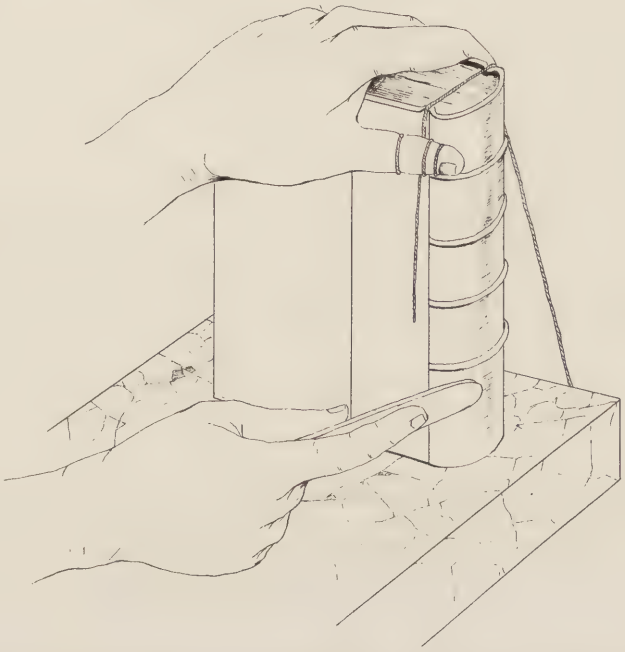
edges, and press the board back, at the same time turning in the leather over the edge of the boards and the outer portion of the back lining. Then adjust the squares, pull out sufficient leather for a cap to cover the head-band, and work in the turn-in snugly on the boards with the thumb and index fingers. The next operation is setting joints and heads.

All books covered with one piece of material are termed " full russia, morocco, pigskin, drilling, buckram, etc.," denoting the material used. The covering material is cut as described in that chapter, and the leather is pared on the turn-in edges. Paste with a medium-thick paste and allow to set, the pasted sides placed together. When the paste feels tacky, open out the material and lay the book on in such a way that the turn-in will be of equal proportion on the head, tail and fore edge. Then bring over the other end with a slight pressure over the back to fit it snugly, and rub the material forward, right and left. Do not stretch the material on the sides, as it will weaken it and warp the board when dry. Adjust the book so that all the turn-in will be of equal proportion. The turning in of the ends and subsequent operations are above described. If there is too much leather on the corner, throw back the board on a paring stone, and pare away enough to permit a neat turn-in. The turn-in on the fore edges is done after the material has been turned in on the head and tail. The next operation is setting joints and heads.

SETTING TIGHT JOINTS.— Take the book with the left hand and hold firmly. The rubbing-up stick (grooved stick) is held in the right and the leather rubbed close to the bands. If the band nippers are used, the operations require greater care. The rubbing must be straight and firm. The book is laid so that the fore edge faces the worker. Throw the cover back, hold the fore edge of the board with the left hand, and have the arm or elbow resting on the end-leaf. Push the board so that the edge and

backing are even; then, with a folder held in the right hand, rub the board tight to the ridge. Then go over the turn-in ends and see that they stick to the board when the cover is thrown open. Repeat the operation on the other board, and then set the heads. When the heads have been set and the book allowed to dry for three-quarters of an hour, the operation is repeated a second time for each book.

SETTING HEADS.— Glue a piece of 16-3/c thread beneath a piece of leather, which is then placed under the paring stone. Then set the book on the edge of the



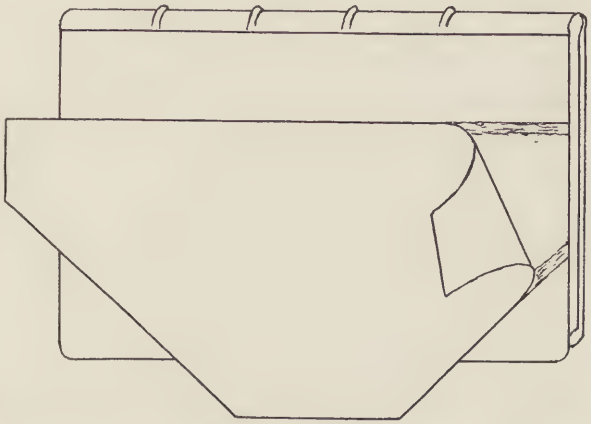
boards, the head-band projecting beyond the edge of the stone. Place the thread between the head-band and boards, hold the book with the left hand, pull the thread tight, and wind around the left thumb. With the point of the folder, push the leather out between the board and

thread, then between head-band and thread on both sides of the book. Then, with a folder, bring over the leather to work a cap for the head-band. Then turn the book and place the edges of the boards and head on the stone, and rub the leather on the back at the head with the folder, down to the stone and again across the width; this should produce a neat-looking head. Morocco leather should not be rubbed, but instead, tapped lightly. A strip of strawboard placed on the leather will prevent the grain from being rubbed flat should more rubbing be needed. Zinc is then inserted between the boards and waste leaves, and the books are left to dry with the leather backs projecting. When partially dry, or in about three-quarters of an hour, set the joints again, and rub the board firmly so that it is perfectly even with the leather visible between board and ridge. Rub up the bands a second time, and go over the heads. When dry, the book is ready for siding.

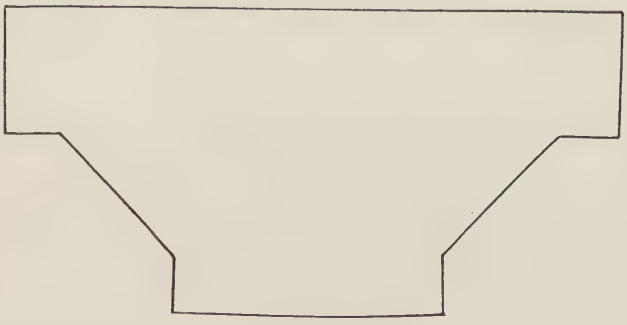
SIDING LETTERPRESS AND BLANK-BOOKS.

Cloth, buckram or imitation leathers are frequently used to side up books. The color of the material should harmonize with the color of the leather. The material must be cut to permit turn-in over the edge of the boards that will cover the squares when the end-leaves are pasted to the board. The corners are cut off so as to allow a visible portion of the leather corner equal to the back. This is done by taking the side and laying it straight on the pared edge of the leather back with equal turn-in on the head and tail ends; then laying a weight on top and folding over the corners so that the edge of the fold will be on the pared end of the leather. The width of the back from the edge of the board to the edge of the cloth should be the same as the width of the leather corner from the corner edge to the center of the side edge on the board. If there are but a few sides to be cut, lay this folded pattern on top of the material with a weight above;

then put the steel square against the fold of the corners, and cut with a sharp knife. Repeat this on the other end. Paper sides can be treated in the same manner. A large number of sides are best glued on the fore edge turn-in



edge, and when dry the pattern placed on top, and the corners cut off on the cutting machine. For cloth, glue must be used, and this should be evenly applied and only a few glued ahead before laying them on. Whenever glue is



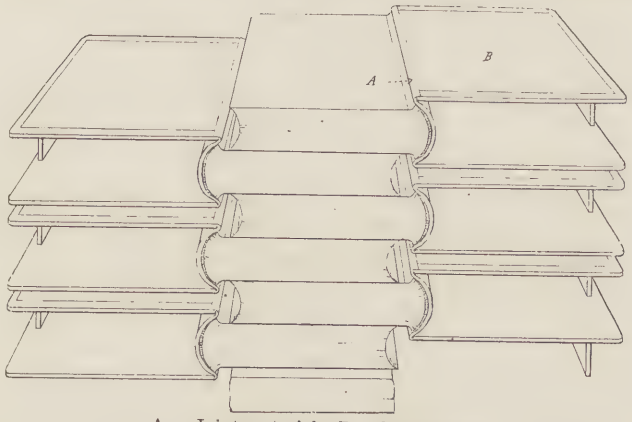
used for the sides, the end-leaves must be glued instead of pasted, or else the outside of the board lined with paper before siding. Glue on the sides and paste on the end-leaves will warp the covers inward. The lining will keep

it flat. Glue on end-leaves can not be recommended. Imitation leathers or buckram can be put on with paste, and are far more satisfactory than cloth. The edge of the material should lay on the pared ends of the leather, in order to avoid peeling up when sliding the book on the desk or table. Zinc should be inserted between the boards and end-leaves to prevent dampness from penetrating the leaves. When dry the books are ready for pasting end-leaves and the final pressing.

CLEARING OUT WASTE LEAVES AND PASTING UP END-LEAVES ON LETTERPRESS BOOKS.

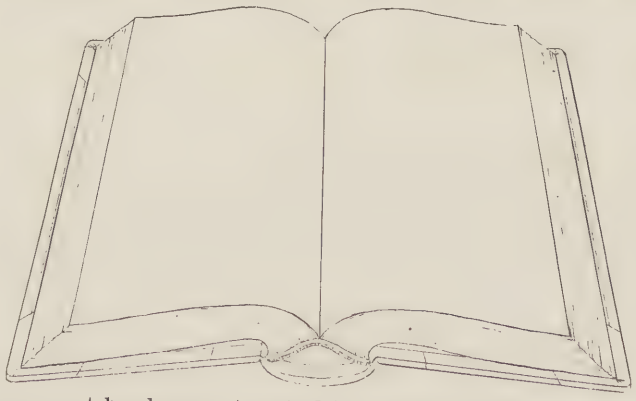
The turn-in on the board of the leather, paper or cloth is, at best, irregular, and needs to be trimmed. To do this, cut a strip of board one-half of an inch wide or somewhat wider for the larger books. Lay it even with the edge of the open board and mark with pencil or folder. Repeat this until the sides have been marked; then take a sharp knife, make an incision, beginning at the top and continuing to the bottom. The knife should be held at a slant to produce a bevel on thick leather; however, it is best to pare the leather if it is too thick, as otherwise it will show through the end-leaf when pasted to the board. Then take the folder and run it two or three times across the open joint to remove the glue and weaken the waste leaf at the ridge. Tear out the waste leaf at the front and at the back of the book and place the straight end of the sheet underneath the cloth or leather joint. Remove any surplus glue or paper that may remain, and clip both ends about one-sixteenth of an inch slant to the edge of the ridge. The paper for the end-leaf should be of the same quality and material as the fly-leaves, and cut one-half of an inch narrower than the width of the board, and one-eighth of an inch shorter than the length of the leaves. Paste the joint material and end-leaf with a medium-thick paste, and leave it for a few minutes to become tacky. Then bring the joint material over on the board, and rub

down firmly with thumb and index finger. Then lay the end-leaf on so that the paper will not be visible when the covers are closed. Rub down the paper on the board, turn the book over, and repeat the operation on the other side.



A — Joint material. B — End-leaves.

All books so treated should be laid aside, with pieces of binders' board cut to the thickness of the book placed between the open boards, and a final rub given the joint.



Subsequent books are treated in the same manner and are piled up on each other with the boards and joints out and the space between the book boards built up. Books so

treated should not be left to dry in that condition over night, but should be closed up in about two or three hours with a piece of No. 60 pulpboard placed between the board and book. The books should then be carefully laid in the press with the round adjusted, and pieces of pulpboard on both sides to prevent soiling or indenting. The press should be run down lightly and the books left in over night. Straight-grain leather may be pressed more firmly than morocco grain, but caution is the part of wisdom, as the back lining may be easily pressed off the back, thus rendering unsightly the entire work of forwarding.

LEATHER BACKS WITH BANDS, MADE OFF THE BOOK.

Whenever the quantity of letterpress books or the large number of lines to be lettered justify it, the finisher stamps the leather backs. Place the bands on papers, which are cut the length and width of the back. This operation has been described in a preceding chapter. Then glue the papers and bands, and lay them in the centers of the leather backs. The rubbing-up of the bands is also done as described in a preceding chapter. After the backs have been stamped, glue the back linings of the books, place the leather backs on a steam pipe, or slightly curve them by hand and paste with a thick paste. Then leave to set until it becomes tacky. Take a sharp knife, open the books and slit the back linings at the heads and tails on both sides to permit the leather to be turned-in over the outer linings. Draw the leather backs on, and be sure that the head titles are not at the tail. Turn in the projecting ends, and continue the operations as described under a preceding head.

COVERING WITH EMBROIDERY, SILKS AND SATINS.

To cover a book with embroidered material, the back of the book should be lined with leather, the hinge inserted between split boards, with an open joint. The

back lining is executed as described in that chapter, and bands are eliminated. Take a sheet of paper the size of the material, glue it with a medium-thick glue, and when it becomes tacky, lay the embroidery on it. Make a cotton ball, covered with leather, and pound the material so that it will stick to the paper. When dry, apply a coat of medium-thick, slow-drying glue to the paper, and proceed in the regular way as described in the chapter on covering tight or open joint letterpress books.

Silks and satins are treated in like manner. Clean hands are essential, and the greatest care must be exercised in covering with any of these materials. These bindings are very appropriate for wedding gifts, especially when dress-goods material is employed.

PADDED BOARDS.

An attractive style for poetical works is the padded boards. For this style the books should be forwarded in the usual way, with an open joint and split boards. The boards should be thinner than for ordinary work, because the cotton batting will make it appear heavy enough. The split boards are made as described under that head. Cut a piece of muslin two inches larger than the board, glue the outer board in the split, and lay one inch of the muslin on the glued portion, then rub down. This will give one inch turn-in over the head, tail and fore edges of the board. Then glue the open portion of both sides of the board, insert the hinge, and press the book until dry. Cut two layers of the cotton batting the size of the boards, two layers one-half of an inch smaller, two layers one inch smaller, two layers one and one-half inches smaller, and so on until the necessary thickness is obtained. Glue the outer side of the board, lay the smallest piece in the center, then lay the next smallest on top, this being repeated until the cotton batting, which is the exact size of the board, is laid on. Trim all overhanging cotton flush with the board, dampen the muslin, turn the board

over, and glue about one inch at the head, tail and fore edges. Allow the glue to become tacky, then stretch the muslin over the fore edge of the board, rub down, and repeat the operation for the head and tail. Then cut the covering material with one inch turn-in over the edges of the board. If it be leather, stretch it; that is, dampen it and leave to dry between pulpboards; if silk, satin or embroidery, line it with paper as described under that head. Glue the back lining, open the joints, and glue one-half of an inch of the muslin on the outer side all around with a thick glue. Lay the book on the covering material, and glue the other side of the muslin in the same manner. Stretch the material enough to be perfectly flat, and rub down. Then glue the head and tail ends, turn in over the back lining and the edges of the board, and set the heads. Then glue the turn-in on the fore edges and the turn-in over the edges of the board. When dry, trim the turn-in on the inside of the boards, paste the joint material to the joint and board, and paste a sheet of paper of the same color and material as the fly-leaf to the board. This should be cut a trifle smaller than the length of the book and three-eighths of an inch narrower than the width. This should be left open to dry. If the board is to be lined with silk or satin, proceed as described under that head.

SCRAP-BOOKS.

These books are used for tipping or pasting in autograph letters, sketches, newspaper clippings, or any other matter which one may desire to preserve. They are made with stubs to take up the thickness of the pasted or tipped sheet; thus, when the last page has been utilized, the thickness of the body of the book is nearly the same as the back. To make these, cut the paper the length and twice the width of the book. Fold one sheet, and mark it from five-eighths to one inch, according to the thickness of the book, from the fold. Set the slot perforator on the mark, and feed the entire amount of paper through the machine.

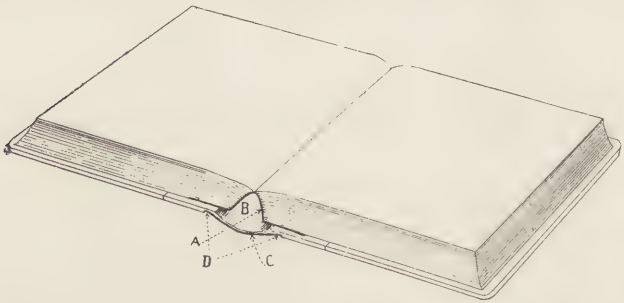
Then divide the paper, and turn one lot around, and gather. This, when folded, will alternate the perforated with the unperforated leaf. Make up the sections as described in the chapter on making up and section folding. Then sew, and forward in the regular way. When the book is bound, the surplus paper on the stubs may be removed, or allowed to remain and be removed whenever the tipping or pasting is about to be done. This has an advantage over other methods in that the book can be trimmed without inserting sheets to fill up the book. The use of the additional paper is more economical, and produces a binding much superior to that made by the obsolete method of folding the stub over and filling in with waste paper or board.

Books with long and short stubs should be provided with sufficient overplus to trim the edges. Perforate both ends so that when the paper is alternated and folded, there will be a difference in the stubs of from one-half to three-fourths of an inch. Forward the book in the regular way, according to the style desired. The customer can remove the overplus paper when he is ready to use the stub. This provides a solid base to work on. On large orders, books made up in this way can be sewn on the machine, which would be impossible without the overplus paper.

COVERING BLANK-BOOKS.

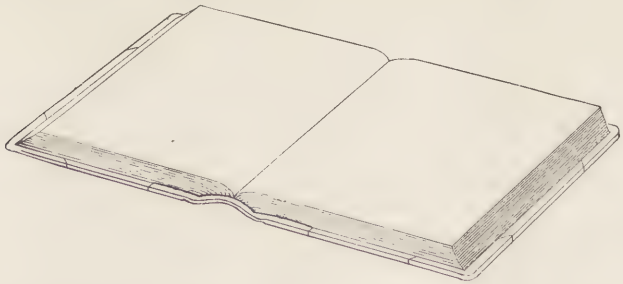
HALF-BOUND LOOSE-BACK.— Make cases as described in the chapter on half-bound cases. Proceed with single books in the same way as for making a pattern. The boards having been tipped on the books, paste the leather, which has been cut and pared as described in that chapter, with a medium-thick paste. Double this up, and leave it for five or ten minutes to become tacky. Open it up and lay one-fifth of the back end of the board on the leather with the same turn-in at the head and tail. Then take the strip of gray rag or manila paper, which is cut the length of the boards and the exact width of the con-

vexed back, and lay it on the leather close to the edge of the back. Bring the leather over to the top side of the board, and see that it is straight. With a folder, rub down the joint and sides. Pick up the book with the right hand on the fly-leaves and fore edge and set the edge of the tail on a paring stone with the boards thrown



A — Flesher leather. B — Manila paper. C — Leather back. D — Joint.

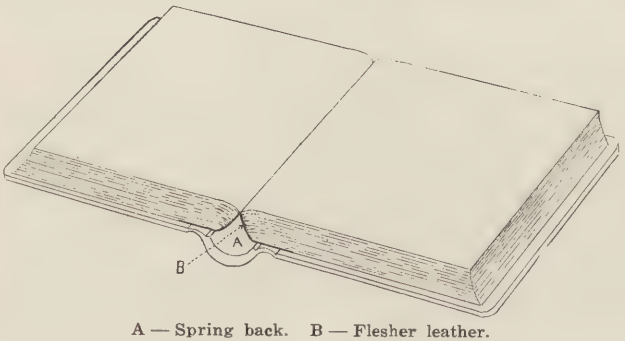
back. Place the breast against the fore edge of the book, both thumbs on the leather, with the fingers on the leather back. Press the thumbs forward, and hold the fingers firmly on the boards; then turn the projecting leather tightly over the edge of the board and gray rag or manila paper which forms the loose-back. With a folder, rub down the joints, back and sides. Lay the books aside with the leather backs out.



HALF-BOUND TIGHT-BACK.— The operations are the same as described in the preceding head, except that the

gray rag or manila paper is eliminated. The backs are glued, and the head and tail pasted. The leather is stuck to the back of the sections. The backs of tight-back books are usually supered, and may be stuck in the case after the projecting ends have been turned over. When dry, the siding operation can commence. The finishing of the back, that is, the lettering, may be done after the leather is cut, if the quantity justifies it. Care must be taken in rubbing down, and a somewhat thicker paste should be used to prevent the gold from coming out. The stamping machine should be hotter than for ordinary stamping.

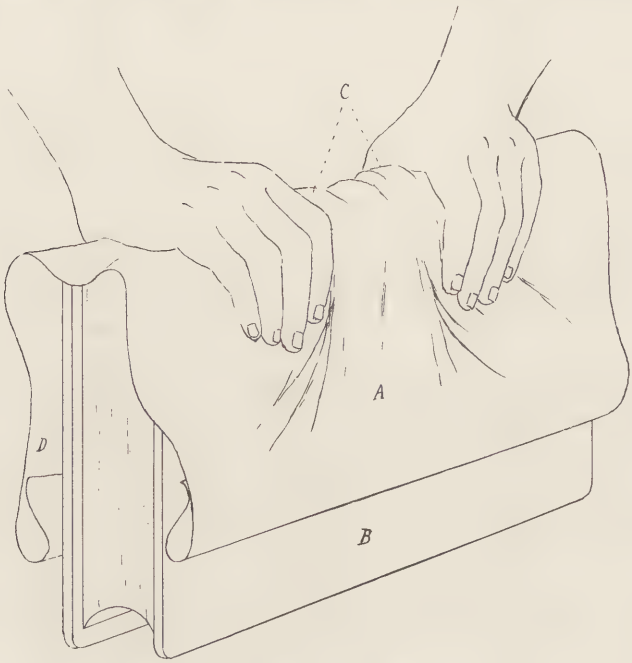
COVERING SPRING-BACK BOOKS WITH CANVAS, MOLESKIN, CORDUROY, COWHIDE AND PIGSKIN.— The canvas, moleskin, corduroy, cowhide or pigskin is cut so that the



A — Spring back. B — Flesher leather.

grain runs the width of the back to facilitate working in the material on the hubs, and four inches larger than the open book. This gives a two-inch turn-in on the ends. The cowhide or pigskin is pared about one-fourth of an inch on the ends. To soften the material and enable a neat working in close to the hubs, fold it in the center, then take up one-half with each hand, and rub together from the center to the end. On beveled hubs this is unnecessary. Wet cowhide and pigskin to permit stretching, working in close to the hubs, and working out wrinkles on the sides. On beveled hubs this is eliminated.

Then paste the covering material with a medium-thick paste, and fold over. If a batch of books is to be covered, paste as many as can be conveniently turned in in one hour. Open out the pasted material one at a time, and lay on a book; bring the other half of the material over,



A — Leather. B — Boards. C — Hubs. D — Turn-in.

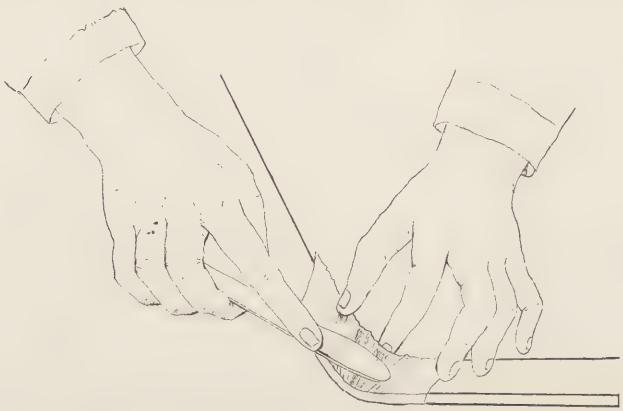
stretch the material and work it in on the hubs. The stretching should be done over the hubs, and enough only to permit the working in of the material. Work enough material from both ends to have the center panel smooth and tight on the hubs, and rub down; next work over enough from the first panel to the first hub. Repeat the operation for the fourth and tail panel, and rub up. The wrinkles thus caused on the sides must be folded closely together or spread out with the aid of the folder. In the case of leather, wrinkles can be easily worked out in this

way. On canvas, moleskin or corduroy it is more difficult. Lift up the material on the sides with the left hand, and rub down on the board with a folder held in the right hand. Turn the book over and repeat the operation on the other side. Stretching in such cases is a necessary evil, which should be avoided whenever possible, as it weakens any covering material and warps the board. Hence, it follows that the height of the hubs should be in moderation, as high hubs require more stretch of the material. Cut the corners of the material to permit a neat turn-in about one-half of an inch from the edge of the corner board. The leather must be pared. This is done by opening the cover, placing it on the paring stone, and paring about one-half of an inch. Then turn in the ends and set the heads.

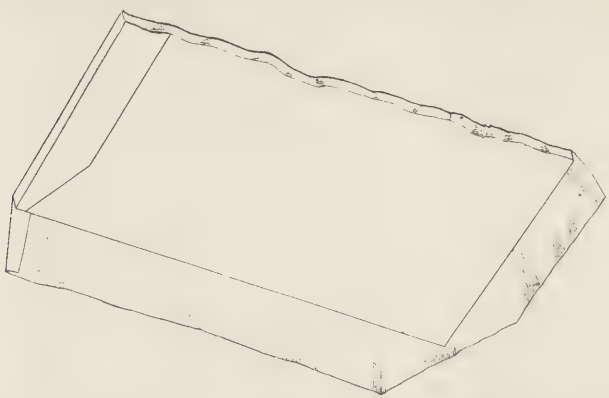
Turning In and Setting Heads.— Take the first book, set it on its back with the end projecting a few inches beyond the edge of the bench. Drop the boards, hold the book, lay a piece of heavy twine the length of the back close to the edge of the spring-back, and turn in the material over the board and spring-back. Now close the book and draw a portion of the material to permit setting a neat head. Work the twine in on the concave side of the spring-back, and press the material with the folder from the edge of the back to the edge of the book. This should cover the convexed edge of the book, as otherwise it would be unsightly. Then take the pointed end of the folder, and press the material in the joint close to the edge of the spring-back. Turn the book around, turn in, and set the head of the tail end in the same manner. Should the book have head-bands, enough of the material is pulled out from the concave of the spring-back to cover them, and is rubbed flat, even with the edges of the spring-back, thus forming caps.

Turning In of Material on the Corners.—After the sides are turned in and the heads set, turn in the pro-

jecting material over the fore edge of the board. The turn-in of round corners is somewhat difficult with canvas, moleskin and corduroy, but by folding together and cutting a portion of the bolt in two or three places, a fairly neat turn-in may be made. A simpler method is



to fold over the material the width of the round corner snugly on the board and sides, then with the finger apply paste on the turn-in sides, lay the ends over first, and then

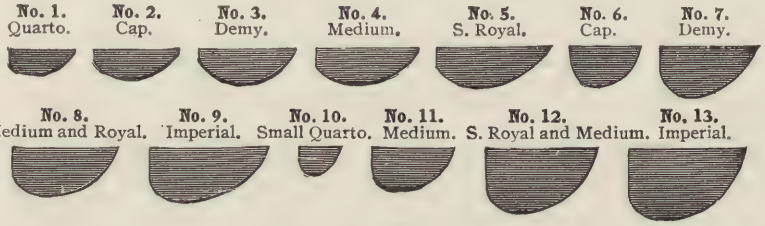


the fore edge turn-in on top. Rub it in well, and hit with the hammer to reduce the bulge. Leather is turned in by carefully gathering up and folding the pared ends

closely together, then pressing in with a folder. A hammer may likewise be employed, especially if the leather is thick and the proper care has not been taken in the paring.

The turn-in of the square corners is made by folding the projecting end of the material over the edge of the corner, and folding in one-fourth of the edge of the fore edge turn-in to prevent raveling. Paste this with the finger and turn in the material over the fore edge of the board.

PRESSING.— Place a sheet of waste paper on a piece of zinc between the boards and end-leaves to prevent the dampness from penetrating the leaves. Then lay a piece

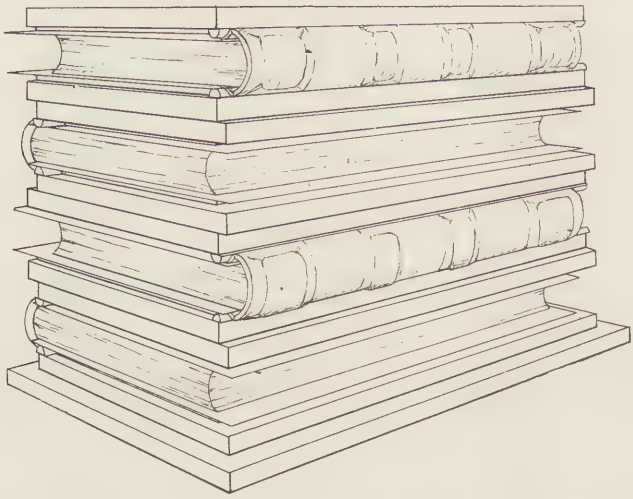


Joint Rods.

of cheap paper on the sides to prevent soiling the material in pressing, place the joint rod on the paper in the joint and lay a pressboard on top. To prevent the rod or board from pressing the spring-back, the board is laid one-eighth of an inch from the edge of the rod. This will permit the rod to be forced in place in pressing. Turn the book over, and treat the other side in the same way, then put the book in press. When a number of books are pressed, reverse the backs to obtain an even pressure. Care must be taken to prevent the joint rod or board pressing the spring-back. The press should be run down firmly, and left for from forty-five to sixty minutes.

The books are then removed from the press, the rods and zinc are taken out, a piece of twine is wound around the joint, and the heads are gone over by pressing out

with the folder the imperfections caused by pressing. Then rub in the material close to the hubs with the rubbing-up stick. On beveled hubs the rubbing up may be eliminated. Put the zinc back between boards and end-leaves to the twine. Remove the twine, insert the joint rods, place a pulp dryer on the pressboards on the sides,



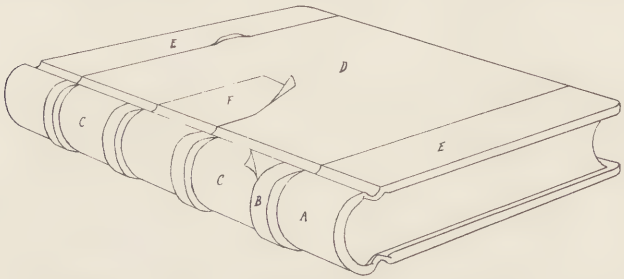
with a weight on top. In this condition the books should remain undisturbed for twenty-four hours. The next operation is to stand the books up to dry, and allow them to remain so for a day. Then end-leaves are pasted to the boards and the books pressed.

COVERING FULL-BOUND ENDS AND HUBS.— The leather (flesher) is cut three inches larger than the open book and pared on the ends, which turn in over the fore edge of the boards. If the leather is thick, fold the length in the center, then gather up the leather at the fold and work the hands up and down alternately, gathering up more leather with the left as the rubbing proceeds, until the right half is rendered soft and pliable; then repeat this with the left half. To prepare for covering, see that

joint rods, pieces of zinc, paper and pressboard are within easy reach, and the press made ready. Paste as many of the fleshers with a medium-thick paste as can be completed in about one hour and fold together. When the leather feels tacky, open out one at a time and lay a book on so that there will be about one and one-half inches turn-in on the front board. Bring the other half of the leather over and stretch it over the back. Never pull on the leather to stretch it over the hubs, as it weakens it and will warp the board when dry. Turn the book over and stretch the leather by pressing on it toward the fore edge on the board near the joint. Then turn in the projecting ends of leather on the fore edges. Set the book on the fore edges of the board and work in the leather from the ends to the center panel until the space between the hubs is tight and rubbed in close to the hubs. Then bring over a portion of the leather to the second panel and rub that down tight between and close to the hubs. Repeat this with the head, fourth and tail panels, lay the book down and work out the surplus leather on the sides. This is done by drawing and folding the leather close together with a folder on the board near the joint. Lift up the leather to within two inches of the joint, and rub it on the board with a folder; turn in over the edge of the board. Repeat this on the other side, then insert zinc, on which waste paper is laid, between the end-leaves and boards. Then lay the book aside and take up the next book. When all the leather that has been pasted is drawn on, put the books in press with rods. Put a sheet of clean paper on the sides, insert the joint rods and lay the pressboard on top one-eighth of an inch from the edge of the rod. Turn the book over, repeat the operation on the other side and lay in the press. Alternate the fore edges and backs to obtain an even pressure. In this condition the books should remain for from thirty to fifty minutes.

The books are then taken out, pressboards, zinc, paper

and rods removed and the books rubbed up close to the hubs. The paring knife is taken to remove the overhanging leather at the head and tail ends flush with the boards, and the leather clipped with shears the shape of a " v " to permit setting a neat head. The cowhide ends and center piece are cut as described in the chapters on

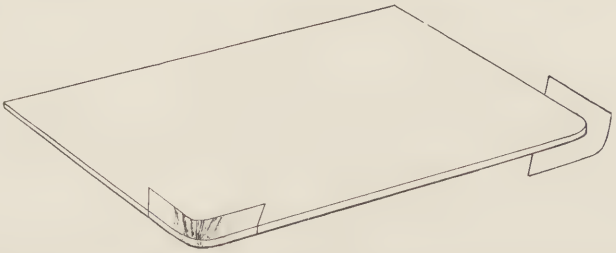


A — Spring back. B — Hubs. C — Title leather. D — Fleshers. E — Cowhide leather ends. F — Cowhide leather centerpiece.

cutting and paring leather, and the turn-in edge and center piece are pared one-fourth of an inch all around. Paste the leather with a medium-thick paste and fold over. When as many have been pasted as can be completed in an hour, take the book and crease a line on the fleshers with the point of the folder from the edge of the hub across the width of the book. Then open out the leather and lay on close to the line and hub. The center piece is then laid on and the operation repeated until all are finished. Turn the books over so as to take the first book and turn in the ends; set the heads and turn in the corners; then put back in press as described in the preceding chapter under that head.

COVERING THREE-QUARTER-BOUND, CLOTH SIDES.— The leather back and corners are cut and pared as described in the chapter on cutting and paring leather. The turning in of the leather corners is greatly facilitated, especially on round corners, if the leather is dampened at the ends. Apply a medium-thick paste and put two

together. Not more should be pasted than can be finished in an hour. Wait a few minutes to allow the paste to become tacky, then lay the corners on the board so as to allow one-half of an inch turn-in over the corner edge. The edge of the leather should be of equal distance from the corner edge on the sides and fore edge of the board. Turn in the projecting ends on the sides and tuck in the leather with the thumb-nail, then apply a little paste and bring over the projecting leather on the fore edge, rub-



bing down with the folder. If the boards are round-cornered, as they should be, fold the leather together the width of the curve and rub down with a folder. The leather should be pared thin and deep for all round corners to permit a neat turn-in. Insert a piece of zinc between end-leaves and boards and set aside to dry. Wet the leather with a sponge and rub the leather across the grain to facilitate working in the leather close to the hubs. This can be eliminated on beveled hubs. Pare the ends as described in the chapter on paring leather. Paste the leather with a medium-thick paste and lay together. No more should be pasted than can conveniently be finished in an hour. Wait a few minutes until the paste has become tacky, then separate the leather backs and lay a book on so that the leather will cover about one-sixth of the board. Then bring over the other end and draw across the back. Stand the book on the fore edge and work in the leather from the ends toward the center panel until the space between the hubs is tight and

rubbed in close to the hubs. Then bring over enough of the leather to the second panel to permit rubbing down tight between and close to the hubs. Repeat this with the head, fourth and tail panels, lay the book down and work out the surplus leather on the sides. This is done by drawing and folding the leather close together with a folder. A careful worker can accomplish this operation and have the edge of the leather on the boards straight. This facilitates siding, as otherwise it is necessary to pare the leather even on the board. Repeat the operation with the balance of the books. The next operation is turning in and setting the heads, which is described in the chapter under that head.

CANVAS, MOLESKIN OR CORDUROY SIDES.— The sides of the above-mentioned materials are cut to permit one-and-one-half-inch turn-in over the edges of the board at the head, tail and fore edges of the board. Paste the material with a medium-thick paste, and lay it on the board even with the edge at the joint and turn in the projecting ends over the edge of the board. Cut off the surplus material at the corners so that the edges join, and do not lap over. Then divide the width of the board into five equal parts and crease with a folder the fifth near the joint, which will be the width of the back on the board. Then take a piece of waste paper and cut large enough to permit one-and-one-half-inch turn-in on the boards. Glue the ends at the head and tail about one-fourth of an inch and lay the paper on the mark; turn in the projecting ends over the edges of the board. Take a piece of paper and measure across the back from the edge of the paper on the one side to the edge on the other. Cut a piece of board four inches longer than the length of the book and the width of the strip plus one inch for paring. Pare five-eighths of an inch on the ends and paste with a medium-thick paste. When tacky, proceed as above described. After the books are taken from the

press, rub up the back, reset the heads and remove the paper on the sides. This is done by laying a square on the leather exactly on top of the edge of the paper. Take a sharp-pointed knife and cut through the leather. Care must be taken not to cut the siding material. Remove the surplus leather and the waste paper and rub down along the edge of the leather. A wide pare of the leather is essential, so that a portion of the pared end remains on the sides. A careful worker will finish the operation so that a quarter inch even pare of the leather is visible on the sides. This will prevent the leather from peeling up, as is common on books thus covered where this is not done. The leather corners are then put on the material as described in a preceding head, with the pared end carefully rubbed in to prevent peeling up. When dry, the next operation is pasting end-leaves and pressing.

PASTING END-LEAVES AND PRESSING.

The last operation in forwarding is the pasting of the end-leaves to the boards. This has been regarded as the finisher's work, but it properly belongs to forwarding. The end-leaves of all open-joint letterpress books, tight and loose back blank-books can be pasted and pressed without placing zinc between the end-papers to keep the dampness from penetrating the leaves. These books are usually made up of the cheaper grade of paper, and if properly forwarded, will not wrinkle. However, all of the above-mentioned styles in a bond or ledger paper should be pressed with a paper-covered zinc between the end-papers. Prepare press, pressboards, pulp or binders' board and a medium-thick paste. Lift the board, hold in a vertical position and apply the paste evenly and sparingly on the end-leaf. Turn the book over and repeat the operation upon the other side. When five or ten books have been treated in this manner, stack the books so that the fore edges and backs will alternate and the boards will be exactly on top of each other. Place the pile in the

center of the press and give a hard pull with the bar. Paste another lot, remove the lot in the press and lay the newly pasted books in the press, then run down. When all of the books have been so treated, place them in the press, laying them on the board in piles of from five to ten books. Repeat the operation until the press is filled and then lay a pressboard on top and put under a medium pressure.

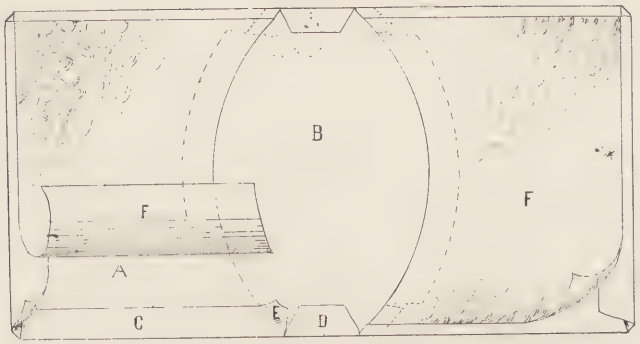
The books are then left in press over night. The next operation is finishing. If the books be half-bound, the alternating of backs and fore edges will press the edge of the cloth of one book into the leather back of the other; hence, it is advisable to place a sheet of pulp or binders' board between the books before pressing.

Marble paper end-papers should be pressed with a piece of paper-covered zinc between the end-leaves and fly-leaves. The first step in pasting the end-leaves of spring-back blank-books is the preparation. Pressboards, joint rods, paper-covered zinc, must be ready and easy of access. The leaf of the paper covering the zinc which comes in contact with the end-leaf should be oiled to prevent adherence to the dampened marble paper. Then lift the board; paste the end-leaves and the flap of the hinge with a medium-thick paste. Repeat this operation on about four books; then insert the paper-covered zinc. Place the joint rod in the groove of the joint and lay a clean, smooth press-board on the side one-eighth of an inch from the sharp edge of the rod. Turn the book over, repeat the operation, then lay in the center of the press. Treat the remaining books in the same way, and put them in the press with the fore edges and backs alternating. Let the press rest lightly on the books, then adjust the rods in the joints to prevent the rods from pressing the spring-backs away from the books. Then run down the press to the full limit. Other books may be placed on top and treated in the same way. The books are then ready for finishing.

CANVAS JACKET.

Books bound in full cowhide (russia) extra hubs, cowhide (russia) ends and hubs, or three-quarter-bound style, that are required to last for a number of years, should have a canvas jacket, which, when worn, may be renewed. The jacket is a protection to the binding and very desirable for permanent records. This jacket should always be made before pasting up the end-leaves and the final pressing, as it prevents soiling the end-papers in the operation. Cut the canvas to allow one-and-one-half-inch turn-in on the fore edge, head and tail, or three inches larger than the open book. For the boards, use a thin, tough board equal to No. 50 binders' board, and cut the exact size of the book-cover boards. Open out the canvas on the bench and lay the book on top with the fore edge toward the body. Bring the other end of the canvas over, and turn it about two inches over the fore edge of the board. Then turn the book and canvas over, and turn in about two inches of the canvas over the fore edge of the other board and put a weight on top. This will afford sufficient stretch of the canvas on the book to produce a tight fit on the hubs. Lay the boards out and glue about two inches of the front end of each board; allow the glue to become tacky before attempting to proceed; then remove the weight from the book cover, place the fingers and thumbs on the head and tail ends and keep the canvas in position while opening the cover and laying it on the bench. Place the left hand on the cover, lift the turn-in canvas and lay the jacket board on the book board, with the glued end up to the fore edge. Then bring over the canvas on to the glue and rub down with a folder. Turn the book around, open the other board in the same manner and bring the canvas over on the other glued board as above described. Then lay the book so that the end projects, with the back to the right on the bench. Take shears and cut the canvas at the bottom, diagonally to

within three-eighths of an inch of the edge of the board at the joint. Turn the book over with the back to the left and proceed in the same way. Then turn the book around and cut the tail ends in the same way. The book is then laid to the edge of the bench and a thick glue applied to the projecting ends of the canvas. Care must be taken to leave enough of the canvas unglued so it will



A — Board. B — Canvas. C, D, E —Turn-in. F — Marble paper.

not stick to the edge of the book board and the joint. Then turn the book around, with the fore edge to the body; lift up the cover, holding it open with the left hand and turn in the right end on the board, pulling it over a little and making it straight. Rub down with the folder and then bring over the left end with the left hand, while the right is holding the cover. The canvas should be stretched enough to have a snug fit and then rubbed down with the folder. Turn the book over and repeat the operation on the other side as described.

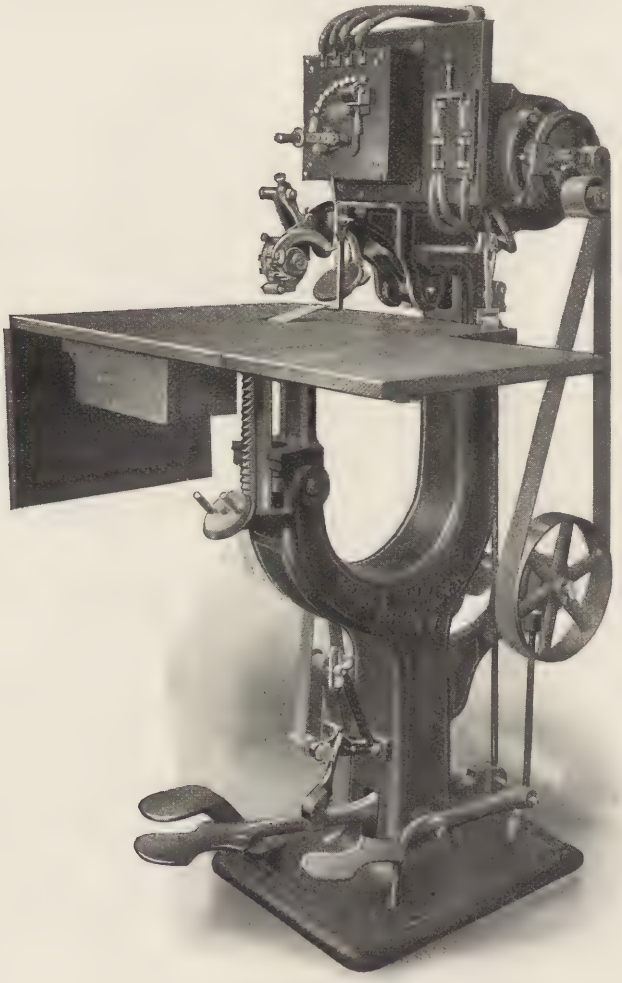
With shears, cut away the surplus canvas on the corner, leaving one-half of an inch for turn-in. Then pull the canvas away from the board, and glue the board and the canvas on the sides. Turn over the canvas on the sides, take a folder and tuck in the canvas on the fore edge of the board; then press the fore edge canvas together. Glue the turned-in canvas with the finger and

bring it over the fore edge of the board; then rub down with a folder. Repeat this with the other corners and place a piece of zinc between the book and cover and set aside for one hour to dry. Then remove the zinc and pull off the canvas cover by throwing back both boards and pulling the jacket on the front. Close the book and lay aside. Take the jacket and cut out a minor segment with about two inches spring out of the boards; this is done by first cutting the segment out of paper and marking the board, then with shears cut out. If the book has beveled or extra hubs, the turn-in of the back portion of the jacket must be cut away so that the canvas which is turned in is no wider than the bevel, or about three-fourths of an inch. Glue the projecting end of canvas at the back between the boards, and turn it in on the canvas even with the edges of the boards. The diagonal ends are turned under the board, thus protecting the corners. Take a folder and rub down. The marble paper for the inside lining is of the same pattern as the end-papers, and is cut one-half of an inch smaller than the book leaf. Paste the paper and put it on the board and canvas so as to leave the proper margins for the squares; the paper projecting beyond the arch shape of the board is cut in to the edge of the board to permit a turn-in under the board even with the arch edge. The cover should then be placed between straw or pulp board and left to dry. Leather corners are superfluous, and as their tendencies are to peel up and prove unsightly, canvas jackets should always be made without them. The next operation is lettering, and this should be done off the book to prevent the type impression on the cover.

Letterpress books which are frequently referred to may also have a jacket, but this should be made of thinner material, such as drilling. The operations are the same as described for blank-book jackets.

PAGING.

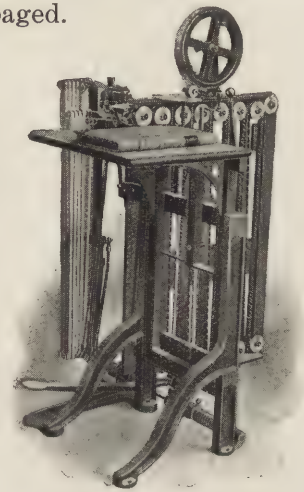
The paging of books is executed on machines with the aid of the smut tape which moves with each impression. Page the odd numbers first, and when the last page is reached, change the head and repeat the operation on the



Hoole Paging and Numbering Machine.

even pages. Because of less danger in skipping pages, some prefer to number consecutively both sides of the leaf. The first method is quicker and preferable with a careful operator.

Folio pages may have the same number on the left and right pages, or the right page need only be paged. On books containing long and short leaves, the short leaves should not be paged.



Rapid Double Paging Machine.

DOUBLE PAGING MACHINE.— This machine is designed to page both sides of a leaf in one operation. It will page consecutively, commencing on the right or left hand page, or print the same figure on both the right and left hand pages, by having the required chains of figures made. The figures are inked three times, and the impression registers on the page. The machine is easy to operate, as the leaves are fed through the machine but once. The figures are fastened on to an endless chain and move forward in proper rotation, making it unnecessary for the operator to watch the figures. The impression of the type upon the leaf is accurate and reliable. It is capable of paging from eighty thousand to one hundred thousand pages per day.

LOOSE-LEAF BINDERS.

The mechanical construction of Figs. 1-3 consists of a three-piece round back made of steel, and rigidly connected. It is operated by a propelling screw rod, having right and left triple threads carrying traveling nuts, which are connected with side plates with heavy steel

Fig. 1.

arms. The screw rod is anchored to the back plate at both ends and in the center, with heavy steel braces at both ends. The posts and the hinge lugs are fastened to side plates. The back is nickel-plated, all exposed parts

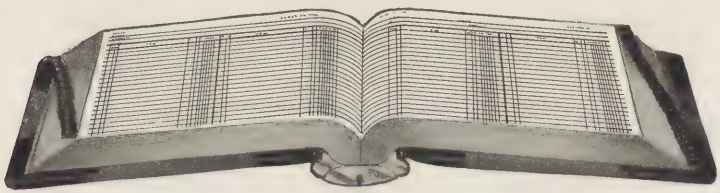
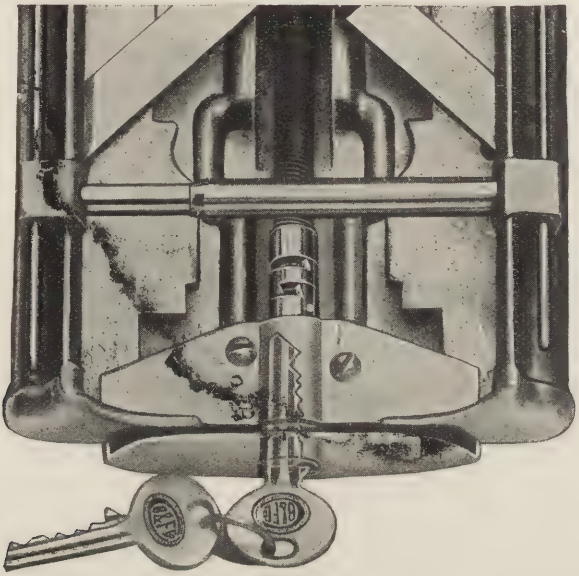


Fig. 3.

are polished and corners and edges are rounded. Special locks can be attached to these metal fasteners, which have special grooved keys. They can be attached to the inside of the back, and strengthen the mechanism. The same key that unlocks the binder operates the controlling screw

rod, which expands and contracts the mechanism. There is no key in existence that will unlock more than one binder; no sheets can be removed or inserted without a particular key. The mechanism is so finely arranged that the variation of one-thousandth part of an inch of any of the cuts in the key would prevent the key from operating the lock; yet this can be made in one hundred thousand different styles of keys.



Expansion Loose-leaf Back
(Chicago Binding and File Co.)

The cover should be made of the best quality of binders' board, built up, beveled, round-cornered and covered with a strong material such as corduroy, moleskin, cowhide or pigskin. To bind, wash the metal with a solution of one part muriatic acid to twenty parts of water, and avoid touching the nickel-plating. When dry, apply a coat of glue, consisting of one part of muriatic acid and

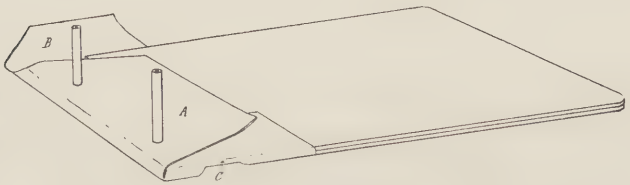
twenty parts of glue. Cut a piece of corduroy, moleskin or canvas of sufficient length to fit between the nickel-plated ends and wide enough to turn over the sides; glue it and lay it on. This is put on to act as a cushion and prolong the life of the subsequent covering. The covering material should be cut the exact length of the space between the nickel-plated ends and wide enough to cover the parts. If leather is used, the ends should be pared. Paste the material and allow it to become tacky; put it on the back, turn over the ends and rub down. The sides are covered in the same way, except that a portion of the leather must be cut to fit over the hinge holders. Cut the boards the length of the metal fastener and wide enough so that when hinged to the fastener it is three-fourths of an inch wider than the sheet. This will protect the index tabs from being mashed. The thickness of the board should be equal to the curve of the metal hinge. These boards are made up as described under "Boards for blank-books." The ends should be beveled, and the corners on the fore edge rounded (see "Beveling"). Cut the leather for the corners as described under "Three-quarter-bound style." The metal hinge is inserted between the two boards nearest the paper, with the curve up. The leather for the back is cut large enough to permit a portion on the board equal to about one-fifth the width of the board and long enough to permit a turn-in to cover the squares and metal hinge. Pare the ends and the portion which is turned over the corner of the metal hinge in a way which will permit of a neat turn-in. Then pare the leather corners. Paste the leather and, when tacky, put on the corners; then lay the leather on the board, rub it down, turn in the ends, tuck in the corners and bring over the leather to cover the hinge. Allow this to dry, then cut out the leather on the metal hinge which covers the portion intended to fit between the hinge holders of the metal fastener. The siding is done as

described under that head. The inside of the board is lined with the same color of paper as the end-leaves.

Two end-leaves should be made for each cover, and the binding end reinforced with cloth, buckram or drilling

strip about two inches wide, and colored or marble paper pasted on the side, covering the edge of the cloth, buckram or drilling. The next operation is finishing.

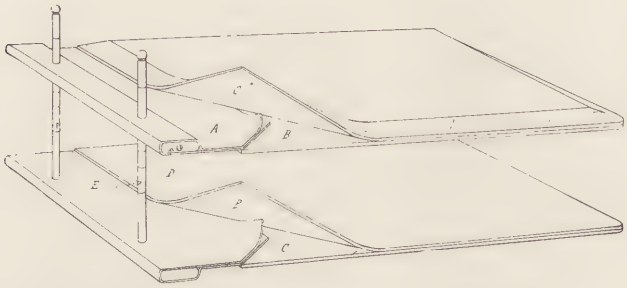
SECTIONAL POST BINDER.— This binder consists of two plates formed of oval steel tubes. In the top tube there is a lock made of one piece which locks on both posts with one turn of the key. There are rubber plugs



A — Leather back. B — Turn-in. C — Joint.

or bumpers on the ends, which prevent the wearing through of the leather at the ends of the tubes. The posts consist of sections, which may be screwed on, and thus expanded as desired. These fasteners are supplied by different loose-leaf manufacturers.

To bind, wash the tubes with a solution of one part of muriatic acid to twenty parts of water, then cut a strip of canvas the length of the tube and about seven inches wide. Punch two holes to fit the posts for the bottom tube, glue the canvas and lay the tube on; next bring the canvas over and rub down close to the tubes



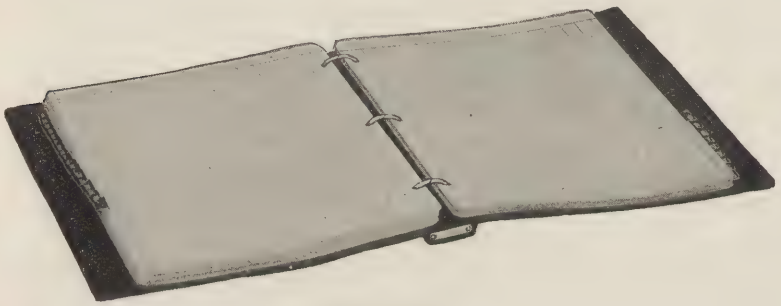
A — Canvas. B — Inner board. C — Outer board. D — Tube fastener
E — Sectional posts. F — Bevel.

and straight with the edges of both tubes, which will clinch the paper. Repeat the operation for the top tube. Cut the board the exact length of the tubes and the width about one-half or three-fourths of an inch larger than the sheets. This is necessary to cover the index tabs which are frequently used on all loose-leaf binders. The thickness of the board should be about the same as the tubes, or about two hundred and eighty-seven points. These are made with one end open to insert the hinge. Then bevel the four ends. When dry, glue both sides of the open board and insert the canvas one inch from each tube; then put in the press, with the tubes out. Cut the covering material and punch holes to insert the posts of the back tubes. If the style is to be russia back and corners with cloth, buckram, or texoderm sides, cut the leather as described under " Cutting and paring leather," and allow enough leather to cover the tube joint and to

extend about one inch on the board. Pare the leather, and where it turns in over the corner edge of the tube, cut away to permit a neat tuck-in and slant the remainder the width of the squares. Paste the leather, and when it feels tacky, lay it on the board; rub it down on the board and joint; then turn in the ends over the tube, joint and boards. Tuck in the surplus leather on the corners, then bring over the end and rub it down. To insure the leather sticking in the joint, strips of board can be cut the thickness of the side boards, laid on the leather, then placed between boards with a weight on top. When dry, the covers are ready for siding and lining the boards, as described under those heads. The covers should have end-leaves, which are made as above described. The next operation is finishing.

PRICE BOOK-RING BINDER.

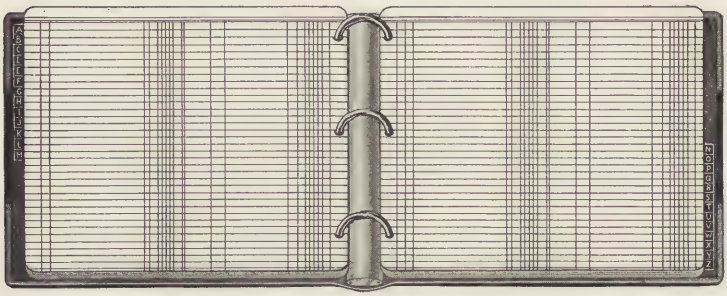
The mechanism consists of two steel rods on which the rings are mounted. These are held in position by



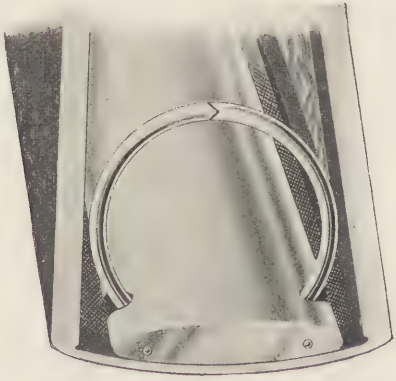
Ring Binder.
(Chicago Binding and File Co.)

polished end-pieces and a spring which keeps the rings closed. The rings open in the center and close with a ball and socket connection. These metal parts may be purchased in two widths — one-half and one inch. To

bind, fill the space between the side rods with pulp or cloth board strips. Wrap with thin, tough paper to hold the strips in position, being careful not to glue the paper to side rods. Reinforce the back of the cover with a thin strawboard strip. Then cut the gray felt paper or flex-



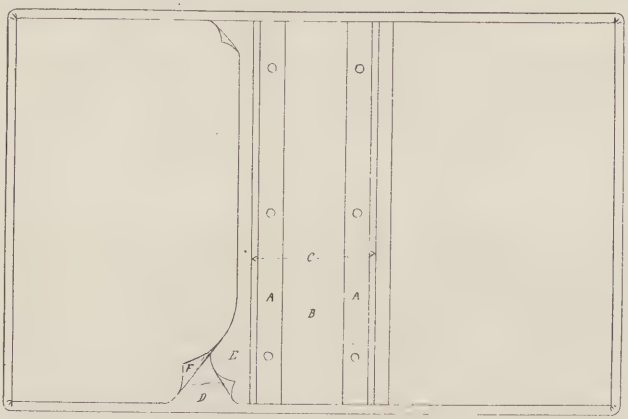
ible board the length of the fastener and the exact width of the sheet to be used in the binder. Cut the covering material large enough to permit a $\frac{5}{8}$-inch turn-in at the head, tail and fore edge. If leather is used, pare the ends as described under that head. Then glue the back of the



fastener, lay it in the center of the covering material and rub down. Then glue about one-fourth of an inch on the ends of the boards or paper, and lay the glued end on the covering material one-half of an inch from the inner

edge of the fastener. If a flexible style is not desired, the paper or board for the sides can be glued to the covering material. Then glue, or if the quantity warrants, paste the turn-in ends, and turn the material over the edge of the paper or board. Allow this to dry, then glue the paper on both sides of the fasteners and rub the covering material down. Then cut a piece of skiver or cloth one-half of an inch less than the length and two inches wider than the width of the fastener; punch holes to fit the rings; then paste, placing the rings in the holes and rub down flat on the fastener, joint and sides of the cover. Cut the paper for the inside lining of the cover so as to provide one-fourth of an inch for the head and tail square and one-half of an inch for the fore edge. Paste it, lay it on and rub down. The cover should be placed between boards and left to dry.

When there are a number of covers, it is preferable to make cases. End-papers are made as described above. The next operation is finishing.



A — Hinge. B — Back. C — Joint. D — Turn-in of covering material. E — Back lining. F — Paper lining.

LOOSE-LEAF COVERS.— Frequently there are demands for a cheap cover in which loose sheets can be preserved by means of cord or other fasteners. These are made by

cutting binders' board about one-fourth of an inch larger than the width and one-half of an inch larger than the length of the sheet to be used. Then cut a strip three-fourths of an inch wide off the width for the hinge. Punch three holes about three-sixteenths of an inch in diameter, one in the center, the other two about one and one-half inches from the head and tail. Measure the thickness of paper to be used in the cover, and set the case gauge the exact width. Cut the covering material large enough to permit a ¾-inch turn-in on the fore edge, head and tail. Then glue or paste the covering material, and lay on the left board three-fourths of an inch from the edges; then lay the hinge strip one-fourth of an inch from that board, and the case gauge even with head and side edge of the hinge. The right side hinge is laid close to the gauge and the board one-fourth of an inch from its edge. Then cut off the corners so as to permit a neat turn-in. Turn in the ends over the edges of the boards and rub down. When dry, cut a piece of book cloth one-half of an inch less than the length of the boards and wide enough to extend one-half of an inch on both boards, covering the hinges; glue, lay on, and rub down. Then cut the paper for the inside lining three-fourths of an inch smaller than the board, glue or paste it, lay on so as to equalize the squares and rub down. With a sharp knife remove the material covering the holes in the hinges. The cover is then ready for finishing.

FINISHING.

The embellishing or ornamenting of book-covers by hand with ink, foil, imitation gold leaf, aluminum leaf, silver leaf, gold leaf or impressions in blank, is termed "Finishing." The cutting and bending of brass tools is no longer necessary, as any kind of scroll or design can be purchased. Stamping and embossing are machine finishing, which make the work of the ancient craftsman, thought difficult and a drudgery, a pleasant task.

The styles of finishing vary, but in most establishments consist of filleting and lettering. A badly-bound book does not become a work of art when it has been artistically decorated; it calls forth condemnation because of the laxity in forwarding and wasted energy in finishing. But given a well-bound book as a foundation, the ambitious craftsman may devote considerable study to design, the execution of which is the art in bookbinding. If he be neat, patient, capable of close application, and have ability for drawing, he has all the essentials for a successful finisher. The difficulties encountered may be surmounted by strict observance of every detail, consideration of the quality, the preparation of the leather according to the atmosphere, and the temperature of the room.

FINISHING TOOLS.

BAND CREASER.—A hand tool with a flat surface cut in lines.

BLANK ROLLS.— Brass rolls about four and one-half inches in diameter, faced with ornamental designs and used for branding sheep or fleshers.

BLOCKING PRESS.—A stamping press for impressing blocks or dies on covers.

CAMEL'S-HAIR BRUSH.—A soft brush about four inches wide, used for glairing; a small, soft brush used for penciling with size after blanking.

CHASE.—An iron frame in which type, borders, etc., are locked for stamping.

CREASER.—A curved tool, with lines upon the face, attached to a long handle. Used for blind-tooling the sides of books.

DIES.— Brass, zinc or heavy electro plates used for embossing or stamping on covers the lettering and ornamental designs.

FILLET.—A cylindrical instrument upon which lines are engraved.

FILLET PAD.—A mechanical contrivance which unwinds ribbon gold leaf; used for fillet and gilding rolls.

FILLET ROLLS.— Brass rolls about four and one-half inches in diameter, with one, two or three lines upon the face.

FINISHING PRESS.— Two pieces of hardwood two and one-half inches square, with hand screws on the ends; used to hold books for back finishing.

FINISHING STAND.—A board sixteen inches wide and twenty-four inches long, with a hand-screw attachment on the side to fasten it to the bench, and a sliding shelf with an arm, adjusted by a thumb-screw on the other side; used for finishing blank-books.

GILDING ROLLS.— Brass rolls about three and one-half inches in diameter, faced with ornamental designs.

GOLD CUSHION.—A box padded with cotton and covered with sheep or calf skin.

GOLD KNIFE.—A flat blade sharpened on both edges, with a wooden handle.

GOUGE.—A tool, the face shaped as the segment of a circle.

HAND STAMP.— Brass tool, faced with an ornamental design and having a six-inch wooden handle.

INDEX ROLLS.—Alphabetical brass rolls used for lettering indexes.

INDEX SHEARS.—A curved or an ordinary pair of shears, with an adjustable gauge.

LAYING-ON PAD.—A piece of board to which a handle has been glued or nailed, and having the bottom padded with cotton and covered with moleskin, flannel or fleshers.

LETTERING PALLET.—A type holder about seven inches long, with thumb-screws and wooden handle, used for lettering.

PALLET.—A brass hand tool with about three-and-one-quarter-inch surface engraved as gilding rolls.

PLATE.—A plain surface of lead with a copper face, or a flat piece of brass upon which is a raised design for stamping.

POLISHER.—A piece of steel 2 by 2 inches, curved and graduated to a dull point, with a fifteen-inch wooden handle.

FINISHING ACCESSORIES.

ALUMINUM LEAF.—A bright, non-tarnishing leaf made of aluminum, which is substituted for silver in stamping.

CHALK.— Used to prevent gold leaf from adhering to the gold cushion.

DUTCH METAL.—A readily-tarnishing imitation of gold leaf made of composition metal.

EXTENDED TABS.— Leather tabs made to extend from the edge of the leaves.

FILLER.—A substance used to fill up the pores of leather.

FINISHING POWDER.—A powder used in side lettering on single books.

FOIL.—A composition leaf made in different colors; used in stamping book-covers.

GASOLINE OR BENZINE.— Used for cleansing and removing gold leaf after gilding or stamping.

GELATINE.— Substitute for size or filler; preferable for aluminum stamping.

GLAIR.— The white of egg or albumen dissolved in water. Applying the same is termed "Glairing."

GLYCERINE.— Used in filler or water to keep the leather moist.

GOLD LEAF.—A thin leaf of gold.

GOLD RAG.—A piece of cotton flannel into which a small quantity of olive, lemon or cocoanut oil has been rubbed. Used to rub off the surplus gold.

GOLD RUBBER.— Pure or para rubber dissolved in mineral oil or turpentine. Used to absorb the surplus gold, thus reducing the waste to a minimum.

GOTHIC TABS.— Cut-in index with the lettering on cloth, which is pasted on the visible portion of the cut leaves.

GUM TRAGACANTH.—A marbling size used as a filler in preparing books.

OIL OF WINTERGREEN AND SASSAFRAS.— Used to prevent souring or frothing of the size.

OLIVE OIL, COCOANUT, LEMON.— Used to temporarily hold the gold leaf to cloth, leather, etc.

PASTE-WASH.—A thin paste.

RUBBER.— Pure or para rubber dissolved with mineral oil into a mass is used to remove surplus gold.

SIZE.—A binding medium, other than glair, which attaches the gold to leather, cloth, etc.

SPONGE.— Used to glair or size leather or cloth.

STARCH.— Used to make paste and to make filler in preparing books.

VARNISH.—A gloss-giving liquid applied to books to brighten the leather.

VASELINE.— Used to temporarily hold the gold leaf to leather.

PROCESS TERMS.

ANTIQUE.— Term applied to a style which is tooled in blank, the book bound with thick boards, beveled and gilt-edged.

BLANKING.— Term employed in reference to stamping. Impression made on cloth or leather by heated brass dies on a stamping machine.

BLIND-TOOLING.— Impressing warm hand tools on binding material. Sometimes called "Antique" or "Blank" tooling.

BRANDING.— Rolling fleshers or sheep with hot rolls.

BUFFING.— Cleaning and roughing fleshers with sandpaper.

BURNISHING.— Process of producing lustre on gilt, colored or marbled edges by means of agate or bloodstone.

DENTELLE.—A tooled border resembling lace-work.

DOUBLE.— The ornamented inside of the cover of a book, made with tooled leather, silk or other material; also termed "Doublure."

EMBOSSING.— The process of stamping leather, cloth or paper with a plate or die for the purpose of producing a raised or relief effect.

FILLETING.— Gilding back or sides with fillet rolls.

FINISHING.— The part of a binder's work which consists in lettering and ornamenting the cover.

GILDING.— Process of attaching gold leaf by means of hot type, tools, stamps and rolls.

HAND-TOOLING.— Executing designs on binding material with hand tools.

INDEXING.— Cutting-in, lettering or pasting on cloth or leather tabs on the visible portion of the leaves.

INLAYING.— Pasting cloth, paper or leather flush with the surface of covering material.

JANSEN.— Finishing without line or ornament in blank or gold. Ornamentation is allowed on the inside of the cover, but absolute plainness, except the lettering, is required on the outside.

LETTERING.— Impressing type upon binding material with a pallet in ink, foil or metal leaf.

MITERING.— Ornamenting the cover of a book with straight lines which meet each other without overrunning.

MOSAIC.—A design with different colors.

PANEL.— Space between bands or hubs on the back of books. The space marked off with prominent lines in gilding or tooling.

POLISHING.— Burnishing leather by means of a hot iron.

STAMPING.— Impressing type or designs on binding material in blank, gold leaf or aluminum leaf with a machine.

TITLE.— The name of the book.

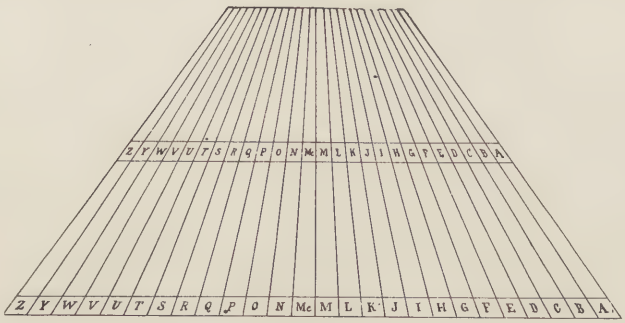
TOOLING.— Ornamenting or giving a final shape by means of a special tool, especially when the mark of the tool is intentionally left visible.

VARNISHING.— Coating the surface with varnish to brighten it.

INDEXING.

To facilitate reference, the index is frequently used on both letterpress and blank books. The length of the book is divided into as many spaces as there are letters in the alphabet, including "Mc." The letter "X" is often eliminated because there are very few names which begin with "X." A handy division scale adaptable to all

books within the range of the pattern is made by cutting a piece of pulpboard 23 by 11 inches. Then six inches in the center of one end of the length are measured off, and the board is cut from the long to the short edge. Both the twenty-three-inch and the six-inch ends are divided into



twenty-seven equal spaces, and lines are drawn from the upper to the lower divisions.

Very often on small books the alphabet is divided into two sections. In such cases the length of the book is divided into as many divisions as there are letters in the row: of the twenty-seven divisions in the alphabet, divide the first half into thirteen and the last into fourteen divisions. This is frequently done on index tabs and letterpress quarter-circle cut indexes, but rarely, if ever, on a cut-in index for blank-books.

Frequently special indexes, designating the days, the months, and division heads of books, are required. These are seldom cut in, as the tab is preferable. The tab index is used on books indexed throughout or where there are many leaves to the letter; the index may be alphabetical or special. If alphabetical, the number of leaves to the letter should be according to the index scale, unless instructions to the contrary are given. Alphabetical index tabs can be purchased from supply houses in all sizes, lettered in ink, aluminum leaf, gold leaf or with metal. Special index tabs are made of buffing, the size

depending on the amount of lettering. Ordinarily the tabs extend one-half of an inch from the edge of the book and one-half of an inch projects on both sides; these are pasted on both sides over the edge of the leaf. Tabs should be reinforced with a cloth shield pasted over them on both sides of the leaf.

There is a scale provided for blank-books which are indexed through the books, which takes into account the requirements of each letter.

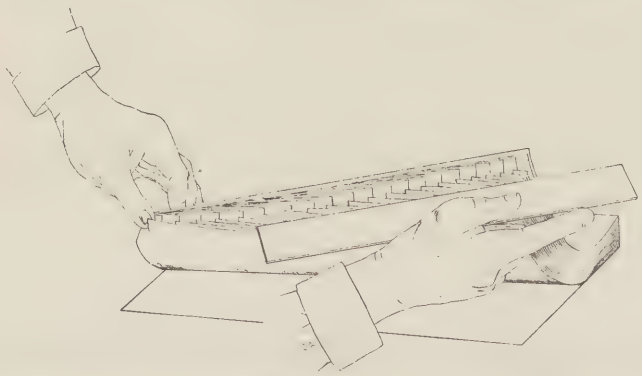
SCALE FOR INDEXING BOOKS.

Letters.	NUMBER OF LEAVES.								
	50	100	150	200	250	300	350	400	450
A	1	3	4	5	6	8	10	11	12
B	3	7	10	17	20	25	29	34	37
C	2	5	8	10	12	15	17	20	23
D	2	5	7	9	11	13	15	18	20
E	1	2	4	5	7	7	8	10	11
F	2	4	6	8	10	12	13	16	18
G	2	4	7	9	11	13	15	17	21
H	4	7	11	14	18	23	27	30	33
I	1	2	3	3	4	4	5	6	6
J	2	3	5	5	7	8	10	10	11
K	2	3	5	6	9	11	13	15	15
L	2	4	6	8	10	13	15	17	19
M	3	7	10	15	18	21	25	29	33
Mc	1	2	3	4	5	6	6	7	7
N	1	3	4	5	6	7	9	10	11
O	1	3	4	5	7	7	9	10	12
P	1	3	5	6	7	8	10	11	13
Q	1	1	1	1	2	2	2	2	3
R	2	5	8	11	13	16	19	21	24
S	4	8	12	17	22	27	32	36	40
T	2	5	7	10	12	15	18	20	23
U	1	1	1	2	3	2	2	3	4
V	1	1	1	2	3	3	3	3	4
W	5	9	14	19	22	28	32	37	40
X	1	1	1	1	1	1	1	2	3
Y	1	1	2	2	3	3	3	3	4
Z	1	1	1	1	1	2	2	2	3

CUT-IN INDEX.— This style index is usually in the front of the book. To cut by hand, take the pattern, insert between the leaves in a convenient position so that the edges of the head and tail are in a straight line with the sides of the pattern. Then take the index shears,

Index Shears.

adjust the gauge to the depth of the cut desired, raise as many leaves as are desired for letter "A" with the left hand, insert the shears and cut on the first line of the pattern. Turn over the leaves and pick up the number of leaves desired for " B," and cut on the second line of the pattern. Repeat this until cuts have been made for



all letters of the alphabet. Then take a piece of tin or zinc a trifle longer than the length of the book and about two inches wide, fan out the cut leaves with the left hand, and with the right hand slide the piece of zinc or tin between the cut from the head to the tail of the book. Then lay a straight edge on the fly-leaf, and with the handle of a sharp-pointed knife, tap the tin or zinc until it fits snugly in the cuts. Place the straight edge in position about one-sixteenth of an inch nearer the fore edge

than the depth of the cut. Slant the straight edge away from the fore edge at the tail just as much as the quantity of leaves to be cut recedes. Then hold the straight edge tight with the left hand, and draw the knife across the leaf close to the straight edge until all the leaves are cut.

On indexes over one-fourth of an inch thick and where there are a number of leaves to a letter, make two or three cuts with the shears until they are cut. Take a pair of dividers, and set them to the depth of the cut, mark the leaves at the cut and tail of the sheet, place the tin or zinc under the leaves to be cut for letter "A." Then lay the straight edge close to the marks, and draw a knife from the first horizontal cut to the tail of the book close to the straight edge. Repeat this with all subsequent letters.

When the cutting is completed, place a little printers' or bookbinders' ink on a composition pad or roller, take a large open type, begin with "A," ink it, and with the right hand impress it upon the head step. Repeat the operation for subsequent letters, impressing each one step below the preceding one. Index rolls will perform this operation in two seconds, beginning at " Z " and finishing at "A." The inking should be done on a composition pad.

Indexing on books which have an index cut in through the entire book is done after the fore edge has been trimmed, colored or marbled. This will permit an even cut throughout the book on both hand or machine index cutting. If bound books are to be indexed through, straighten the fore edge of the leaves before laying on the straight edge, then cut a few leaves at a time. Any other method will show variations in cutting due to the concave of the fore edge.

REINFORCED TABS.—A book in which the index is constantly referred to should have the index reinforced. To do this, cut strips of smooth, light-colored book cloth one-half of an inch wider than twice the depth of the cut, fold

in the center and cut apart, one-fourth of an inch longer than the length of the exposed portion of the steps. Paste a piece of board, zinc, or paper with a medium-thick paste, lay the cloth upon it, take a waste sheet of paper and rub down. Take up one piece of cloth, lift up the first leaf, and lay it on one-half of the cloth, close to the first cut; then bring the other half over and rub down. This will cover the exposed portion of the leaf. Pieces of pulp-board should be placed on both sides of the cloth to keep the dampness out of the leaves.

When dry, letter by hand or roll, as previously described. The cloth may be printed and then put on in the same manner. This is erroneously called " Gothic index " because of the style of type used by supply houses. It is sometimes called " Thumb index " because the thumb is placed on the letter and the index opened.

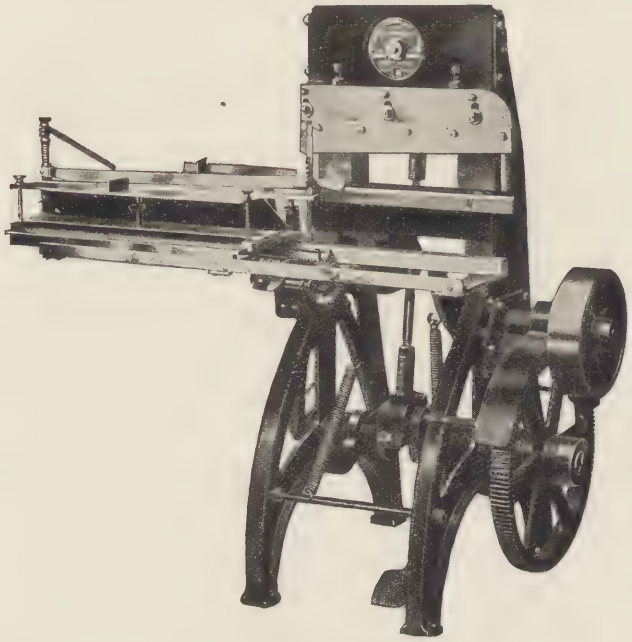
Extended tabs are reinforced with cloth shields, which are cut in the center, and when pasted, are placed over the tab, thus covering the leather on the leaf on both sides.

INDEX-CUTTING MACHINE.— This machine is designed to cut out paper for indexes on catalogues, directories and blank-books. The width of the spaces is from three-sixteenths of an inch to two and one-fourth inches; the adjustments are made on the left side of the machine by pushing the gauge forward or backward, and tightening the cap screws. The receding gauge holds and drops the leaves when cut. The cutting may be repeated on any cut a number of times by stepping on a treadle, which clamps the table, and permits the operator to make any number of cuts until all the leaves for that space are cut. The foot is then removed and the machine allowed to skip.

The table can be adjusted to remain in position by loosening the two knurled head thumb-nuts, on the end of the shaft in the back of the machine, which operates the gear wheel. When it is desired to skip, tighten the large

nut sufficiently so that the friction will carry it the longest skip. To change the spacing, turn the dial to the figure designating the length of the book to be cut.

There is an indicator that revolves with each cut; the number of leaves to be cut for each letter is within sight of the operator. The capacity of the machine depends

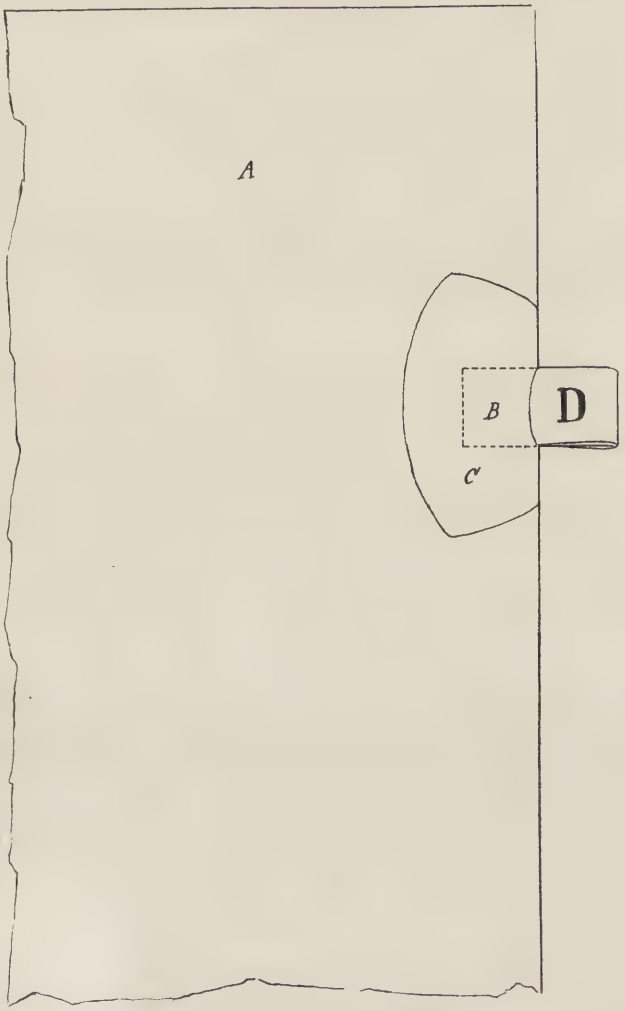


Rossback Index-cutting Machine.

upon the speed with which the operator drops the leaves on the blade. It will cut anything from a small memorandum book to a ledger twenty inches in length and three inches thick.

TAB INDEX.— This style is employed whenever it is desired to index throughout the book, for special heads, etc. To make these, cut leather strips about two inches wide and in length about one-half the length of the book. Fold in the center lengthwise or crease with a folder, then

crease one-half of an inch from the center. Tip the long ends one-eighth of an inch on straw or pulp board. Then paste-wash and glair as described under that head. When dry, lay on the gold leaf and letter flat. Rub off the surplus gold, take the leather off the board, pare the ends,



A — Leaf. B — Tab. C — Shield.

and cut a strip of card or tough index bristolboard one-half of an inch wide and the length of the leather. Glue the leather, lay the half-inch strip in the center, place a piece of tin or zinc on the leather close to the edge of the half-inch strip, bring over the other half of the leather on to the strip and tin or zinc, and rub down. When dry the tin will come out. Wax paper may be used in place of tin or zinc. The tabs are then cut apart and the division scale inserted in the book so that the corners of the leaves meet the edges of the board. Hold the tab with the right hand and apply a thick paste between the open leather; place it over the edge of the leaves and rub down. Count off the number of leaves called for, and place the second tab over the edge of the other leaf, the bottom and top edges of both tabs aligning. Repeat this with the third and subsequent tabs. All tab indexing commences at the head, and "A" or the first tab is placed on the first leaf. Place thin pieces of pulpboard on each side of the tab to prevent the paste from wrinkling the leaves, and let dry.

Alphabetical tab indexes for folio page books are lettered "A" on the front and " B " on the back, and placed on the last leaf of those counted off for "A." Thus the first half of the folio begins with " B," and when opened the intervening leaves appear between tabs lettered " B " on the right and left.

Another method of making the tabs is to lock the type for the index in the chase of the stamping machine, and stamp the leather as described under " Stamping." Glue the cardboard strip, and lay it on the leather in the center, and when dry, glue the leather and strip. Allow this to dry again, then take a small sponge, wet the strip of cardboard, bring the leather over and nip in the press.

PREPARATION OF THE LEATHER.

So much has been written about adulterations of leather that the average finisher is imbued with the idea that the preparation of the leather for finishing is a

mystical science, and that the manufacturers are conspiring to make his work a task. These ideas are the first instilled into the mind of the learner: if his subsequent training is neglected and he does not fathom the principles underlying successful finishing, he manages to succeed in securing employment in small establishments where his shortcomings are overlooked. Such incompetents are easy prey to the tourists, who have the finest recipes for making gold stick for five dollars. They are the possessors of small drug stores in the finishing corners, and all the concoctions which they mix therein spell ruin and premature decay to leather. In addition to the use of acids and other unnecessary ingredients, the novice has been told that urine substituted for water or vinegar in the filler or size is more efficacious. The latter filthy notion is held by novices and also by one-third of the finishers. The most disgusting part of this is that the index finger, which has previously handled the urine preparation, is placed in the mouth to apply the saliva on hot tools. These erroneous ideas concerning finishing are refuted by the Society of Arts Committee in its report on the premature decay of leather in bookbinding:

"Acids of any kind should be avoided. The use of oxalic acid to wash the backs of leather-bound books or for cleansing law sheep is fatal to their durability. Vinegar is injurious when used in the pure state, as it contains sulphuric acid. Wood vinegar contains tar products, and its use is still more detrimental to leather. A small percentage of sulphuric acid will ruin leather — this was, until recently, a legalized addition to ordinary vinegar."

"To sprinkle leather with ferrous sulphate (green vitriol) to produce sprinkled or tree calf, is condemned, as the iron combines with and destroys the tan in the leather, and free sulphuric acid is liberated, which is still more destructive. Iron acetate or lactate is less objectionable,

but the same effect may be obtained with aniline colors without endangering the durability of the leather."

Until leather manufacturers adhere to every detail in the tanning as prescribed by this committee, the finisher is compelled to treat the leather in a way which will overcome the hindrances. The primary object in preparing leather is to insure the holding of the gold or whatever metal is used. Any effort put forth beyond that is unnecessary. In the vast majority of cases, the simpler the preparation the better the results. The mixing of numerous ingredients does no good, and better results may be obtained by the simple preparations hereinafter described. All leather for finishing requires a certain amount of moisture. In dry atmospheres it must be applied, but in damp weather, in most cases, additional dampness is not needed. Glycerine is added to filler to give and retain moisture; no fixed rule as to its application can be given, but a careful study of the demands caused by the work, environment and materials used will bring success.

FILLER FOR LEATHER.— Some leathers are porous and require a filler to enable the glair or size to lay on the surface. The filling of the pores is done by many finishers with numerous concoctions, which frequently are injurious to the leather. The effect upon the durability of the leather must be considered. Ordinary paste is often used, especially on cowhide or russia. Sometimes even a stale paste is used, which undergoes an acid fermentation and favors the growth of molds and bacteria. The volatile oil, the life of the leather, should be preserved. The application of any chemical which destroys this oil, therefore, impairs the durability of the leather. Some finishers use common vinegar or diluted acetic acid in paste as fillers. The vinegar must be of the best quality and must not contain any sulphuric acid.

For the less porous leathers, such as morocco, seal or pigskin, no paste-wash or filler is necessary, unless

the skin happens to be an especially open one, or the cover has been cut from the flank or belly. Then it is best to give it a filler. In the case of morocco, pigskin or seal, sponge with water (if there are a number of books to finish, add glycerine), and before dry, brush briskly with a soft, stubby brush. Repeat the brushing after the blind-tooling is completed, thus brightening the natural color of the leather.

A satisfactory filler consists of four cakes of gelatine, five grams of gum tragacanth dissolved in one pint of hot water. In cold weather this should be warmed before using. Another filler consists of one-half pint of water and ten grams of gum tragacanth, which is allowed to swell and is frequently stirred until dissolved. Still another is made of thin paste and fish glue; this finds favor for cowhide, unpolished calf and tanned sheep. As starch possesses great adhesive power, it may be used by dissolving it in cold water and afterward mixing with boiling water until it forms a paste about the consistency of cream. The addition of glycerine to any of these fillers will prove beneficial when finishing a quantity of books in one operation, as the preparation is thus kept moist for some time. In finishing books which require no filler, one teaspoonful of glycerine to one cup of water to wash the leather is recommended. Many finishers apply two coats of size and eliminate the filler. In that case the first coat is thicker. Russia, cowhide, calf, undressed roan and sheep require a filler.

The greasy surfaces of undressed roans, kids and black cowhides have been the terrors of finishers, but by washing them with a weak solution of alcohol or sal ammoniac, then applying a filler of gelatine and gum tragacanth or starch paste, the trouble may be overcome. Finishing delicate calf leathers requires experience. This leather is soft and porous, but if given a filler of gelatine and gum tragacanth before sizing, it will give satis-

factory results. In applying filler, the backs and sides may be done in one operation.

GLAIR.

A binding medium for gold leaf and other materials used in finishing is necessary. The commercial egg albumen is generally used for both hand and machine finishing, and gelatine finds favor in stamping. Honey and resin can also be used. The white of egg was used by the ancient craftsman, and is, no doubt, the best glair of to-day. The mystery which is usually attached to exceptional successes in finishing, and the trouble of the novices to make the gold leaf stick are responsible for numerous prepared sizes for nearly all class of work. With a proper knowledge of mixing glair, there will be less difficulty in executing the work with egg albumen glair than any prepared concoction. No prepared size should be used unless it is known that it contains no ingredients which are detrimental to leather. Albumen tends to preserve it, while these patent sizes contain crude vinegar, or other deteriorating agencies, many of which are composed of a small percentage of sulphuric acid, a small quantity of which is sufficient to ruin the leather. If vinegar is used, it must be distilled, or a much diluted acetic acid is to be preferred.

White of egg is prepared by breaking the egg and extracting the white; add two parts of distilled vinegar to six parts of egg, and beat this up with a folder or egg beater. Let this stand over night covered. In the morning, remove the top formation, and avoid disturbing the sediment at the bottom. Pour it into a bottle through a funnel, in which a small piece of cotton is placed to filter. To preserve this size, a small lump of camphor about the size of a nut, or essential oils such as wintergreen or sassafras, may be added. These permit of an even application of the size on the material. This is suitable for all

leathers; for cloth it may be reduced to suit the requirements.

Egg albumen is the white of egg in a dry state. It is more used because it is approximately twenty-five per cent cheaper, and can always be mixed with but little trouble. To one-half cupful of egg albumen, add three cupfuls of cold water and two teaspoonfuls of fresh milk and one teaspoonful of essential oils or a small lump of camphor. Allow this to stand for a few hours, and mix with a folder several times during the day. The next morning remove the scum from the top with a stiff paper, stir thoroughly, as a large proportion of the albumen will be settled at the bottom. Allow this to remain standing for a few hours, then filter through a funnel into a bottle through a small piece of cotton. Keep this corked and, if possible, in a cool place. When required, take enough from the bottle for the work in hand, and under no condition return any unused portion.

Many finishers prefer the following preparation:

2 parts of dry albumen.
2 parts of distilled vinegar.
5 parts of water.

Allow this to stand over night and remove the scum from the top. Filter it through a little cotton or cloth; then bottle for use.

Blood albumen is cheaper than egg albumen and is purchased in a dry state. It is the blood serum of animals. Twenty sheep or five oxen will yield two pounds of dry albumen. This is used on leather or cloth when preparing for stamping. Its preparation is the same as described for egg albumen, with the proper reduction as described under "Application of size or glair."

GILDING POWDER.— The white of egg in a dry, pulverized state is used to stamp or letter material such as velvet, satin, silk or paper; in fact, any material on which the application of a liquid is impractical.

The following powders can be made by carefully grinding and filtering through a hair sieve so that they feel as soft as flour:

(a) 1 part bleached shellac.
1 part East Indian copal.
1 part West Indian copal.

(b) 5 parts Dammara resin.
1 part gum guttac.
2 parts East Indian copal.

(c) 1 part albumen.
1 part West Indian copal.
1 part gum guttac.

(d) 1 part gum arabic.
1 part gum sandarac.
1 part gum mastic.

The convenience in the use of powder leads many finishers to use it on cloth and leather finishing. This practice is objectionable, and beyond the lettering of individual names in addition to the afore-mentioned materials it should not be used, because it fails to give the solidity which is attained when books are properly prepared. It looks sandy around the edge, and the gold vanishes on the joint if the fillet projects. On a tight back it will come out after a few openings of the book.

METAL SIZE.— For stamping aluminum leaf or similar thickness of metal, dissolve six or seven cakes of gelatine in one pint of hot water and apply lukewarm. Another size can be made by dissolving one pound of white powdered shellac in one quart of boiling water and adding some preservative such as borax, then reduce as required. Brown shellac dissolved with alcohol is frequently used with good results.

APPLICATION OF GLAIR OR SIZE.—After the books have been washed or given a filler as described in the preceding head, allow to stand for at least thirty minutes, then

apply the glair or size with a sponge or camel's-hair brush. To avoid streaks, fill the sponge or brush with a liberal amount of size and cover the material by long strokes, avoiding as far as possible going over the same surface twice. In sizing the backs, hold the book in the left hand and apply the size with a sponge across the back, commencing at the head and continuing until the tail is reached. If, for any reason, the size should become streaky, rub the sponge or brush on the hair and go over the place a second time. When sizing a great number of backs or covers, rinse the sponge or brush in clean water after every four or five; this will facilitate sizing and permit an even distribution.

To preserve the natural state of morocco, the size is penciled in with a small camel's-hair pencil after the impressions have been made with tools and type; if, however, the books are full gilt, size all over as above described. This can subsequently be removed with benzine or gasoline.

In preparing books, it is best to apply the glair or size to the backs, and complete the finishing before sizing the sides. Otherwise finger-marks are sure to be visible. An experienced finisher can execute the work in less time by sizing the back and sides and refraining from handling the book on the sides. The number of books prepared for finishing should not exceed the number the finisher is able to complete in one day. On large orders it is best to divide the work into convenient lots. It must not be inferred that, if for any reason, the books prepared for one day can not be completed, resizing is necessary. If the books are prepared with gelatine and gum tragacanth, then glaired, it is possible to finish the work a week later.

Leather requires a heavier size for hand-finishing than for machine-stamping. Stronger impressions are made by the stamping machine than by hand, and heavy sizes and heavy fillers are unnecessary. In the majority of

cases when stamping the strength can be reduced one-half to three-fourths.

While parchment and vellum finishing is rarely called for, it can be executed by applying a size made by cutting up isinglass strips in water and dissolving by boiling.

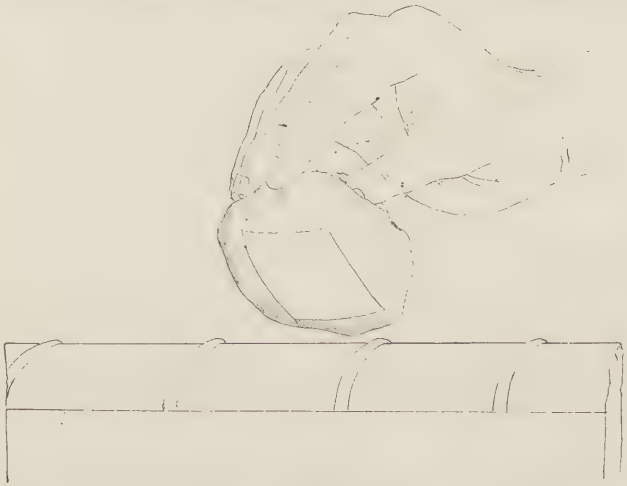
Imitation leathers such as Texoderm, Keratol, Fabrikoid, and a dozen others known by different trade names, are washed with alcohol and left to dry before sizing; if, however, the sizing contains alcohol or ammonia this is unnecessary. Cloth in most cases requires no sizing, as the sizing in the manufacturing is ample, especially when the cases have been made a short time previous to stamping. The moisture in the cases will greatly facilitate the holding of the gold without size. The erroneous opinion prevails that the older the size the better its adhesive properties. Size or glair may be used with good results from twelve to twenty-four hours after it is prepared.

LAYING ON GOLD LEAF.

Different views prevail concerning the medium to be employed to hold the leaf temporarily while the hot tool, type or stamp is impressed. It is evident that whatever is used it must be such as will release all surplus gold after the design has been impressed. For this purpose, olive, cocoanut, lemon oils and vaseline are used. It is argued that cocoanut and lemon oils are far superior to olive oil, and vaseline is superior to all of them, as it is less liable to stain delicate colors of leather. None can be condemned, and all are useful; the individual should make his own selections. The prolonged sticking of the leaf to the covering material is due to several causes — if the material is too moist or if the tools or dies are too hot or if too much oil is employed in laying on the leaf.

Take a book of gold and place it on the left end of the cushion, turn back the top paper leaf, give a few taps on the cushion with the knife to curl one-third of the leaf over, then place the blade near the turned-over leaf, and

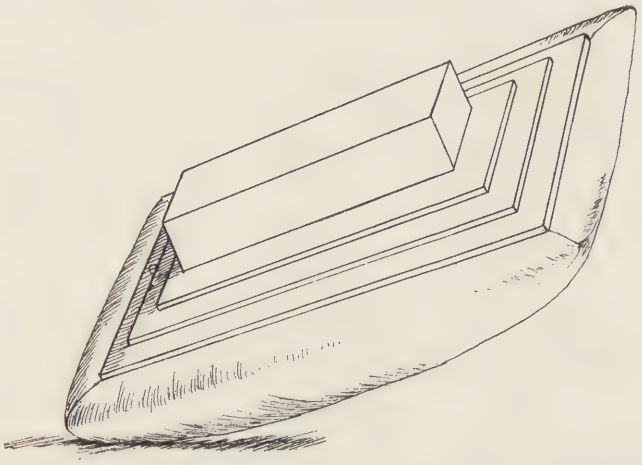
gently blow so that the end of the leaf will fall flat on the blade. Turn the left edge of the blade up slightly and bring the leaf over to the right on the cushion; remove the knife and blow gently on the center of the leaf. The cushion should have a little red chalk rubbed in to prevent the gold leaf from adhering to it. Should the knife become greasy by contact with the fingers, rub it on the chalk. To lay the gold leaf on the backs of books, cut it the size required for the space, or, if the space be too



large, in convenient sizes. With a piece of absorbent cotton, apply a little vaseline, or oil if it be preferred, then take another piece of absorbent cotton, rub on the hair, which will supply a sufficient amount of natural oil to adhere the leaf, and lay it on the leaf; pick it up, and press it lightly on the back of the book. If the size of the space requires an additional piece, repeat the operation, but covering the edge of the gold already laid on. Should there be breaks in the gold leaf, pick up another piece, breathe upon the piece laid on, and place the gold over the abrasion. The moisture in the breath is sufficient to adhere the gold. For hand-tooling, two layers of gold are required, as it affords greater security.

The laying-on of gold for lettering must be done after the filleting and rolling are completed; this should never be done when the material feels tacky. To lay on the gold, paste a piece of ledger paper on the wrong side of moleskin, then cut into convenient sizes. Rub this on the hair and then on the leaf, pick it up and lay it on the back of the book from left to right with a circular movement. This method will avoid breaks and save gold. Besides, on single lines the cutting with thread as a guide can be eliminated, as it is possible to gauge the straight laying-on correctly enough for all practical purposes.

For laying on a flat surface, cut a piece of No. 30 board the size of a sheet of gold leaf, glue enough board together to attain a sufficient height for a handle or else



use a block of wood. Nail the boards to this with wire brads so that the handle will be in the center. Glue the board and lay two layers of absorbent cotton on, cutting the cotton even with the board. Then cut a piece of moleskin, fleshers or flannel one inch larger than the board, glue the board around the handle, lay the pad on the center of the fleshers, moleskin, or flannel, and turn the ends over the edges to the glued side of the board. Ascertain

the position of the stamp on the cover, allow an overplus of one-quarter of an inch, cut the board the distance from the head edge to within one-fourth of the stamp; or, if it be more convenient, cut a strip from the back edge of the board to within one-fourth of an inch of the stamp on the side. Mark the length of the width of the stamp on the board, lay it on the cover even with the edge, rub the pad on the hair, which will furnish sufficient oil to adhere the gold leaf. Rub a little oil on the cover with absorbent cotton. Rub sparingly, as too much will stain delicate colors. Lay the pad on the leaf, even on the left and the further end, press lightly, pick it up, and lay the pad even with the edge of the board to the marked guide with a little rocking motion. Repeat this with another leaf, and overlap the one laid on about one-eighth of an inch. Repeat this on subsequent covers, and stand up on edge or lay carefully on top of each other. Care must be taken not to rub off the gold leaf. The next operation is stamping or lettering by hand.

In filleting or rolling, the gold leaf is picked up with the roll, which has been previously heated and oiled.

LAYING GOLD LEAF ON POWDER.— To lay gold leaf on material which must be stamped with powder, apply the powder to the material with a ball of cotton or a camel's-hair brush. For stamping, place the powder in a box which has two extra fine layers of gauze over an opening, and sprinkle it on lightly. Take a book containing gold leaf, and trim the surplus margins close to the edge of the gold. The leaf will adhere to one side of the paper, which can be picked up and laid on the previously applied powder with the paper on top. This will prevent the disturbance of the gold leaf before the impression is made. The paper is removed after the impression is made. Should the impression leave the gold leaf dull, placing it in the machine a second time will add the desired lustre. Under no circumstances must oil be used with powder.

GILDING WHEEL.— The gilding wheel will hold all sizes of rolls from three-sixteenths of an inch to one and five-eighths inches wide. To insert a roll, lift up the side of the machine, and put it in so that the paper rewinds

from the bottom of the leaf roll to the top of the felt roll. Tuck one end of the paper evenly into the slot of the felt roll. These wheels can be used for heavy side rolling, for stamping; in fact, wherever it is necessary to lay the gold on the material before applying the tools.

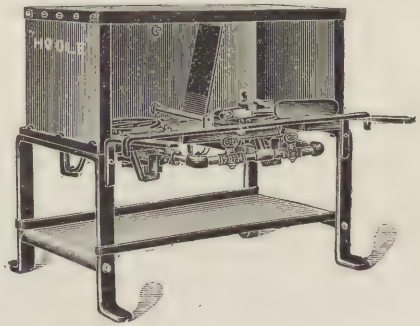
FILLETING AND ROLLING.

This operation should not commence until the books have been prepared from one-half to one hour, according to the condition of the atmosphere or when they cease to feel tacky. If any attempt is made to finish books while considerable moisture remains in the leather, it will be difficult to remove the surplus gold, and if tools have the regulation heat, they are apt to burn and slide over the leather.

The style of finishing must be determined beforehand, and wherever fillets or rolls are required, the position should be marked or a pattern made. On single books without bands or hubs, the length of the back is divided into five equal spaces from the back to within one-half of an inch of the tail edge. This leaves the tail space, which always has an extra line, one-half of an inch longer than the rest of the spaces. Thick books are difficult to fillet

or roll straight, and to guide the eye, the positions of the fillets are marked. Take a thin piece of board about one inch wide, place it on the back where divisions are shown by previously dividing the length as required, and hold it against the sides of the book with the thumb and index finger of the left hand. With a pointed folder, draw across the back close to the board. When books have bands or hubs, these serve as guides, and marking is only necessary at the head and tail. The marking is dispensed with on a large number of books without bands or hubs by experienced finishers. This is done by cutting a piece of board the exact size of the book; divide the length as required into four or five panels, and mark the board. The books are placed in the finishing stand with the board on the side so that the marks are visible, and serve as a guide for the position of fillets or rolls. Letterpress books are best placed in the finishing press, as the backs are firmer.

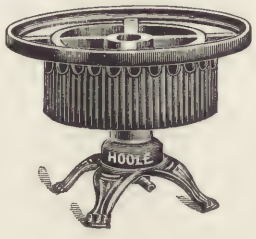
Take a leaf of gold from the book, as described under a preceding head, and cut it into strips a trifle wider than the face of the roll. The finishing stove should be to the



right, next to it the gold cushion, then the finishing stand or press. The face of the roll must be free from dirt, or it will be impossible to make the gold adhere. Rub the surface with charcoal, and then polish with an oiled rag. This should produce a bright impression. Select the fil-

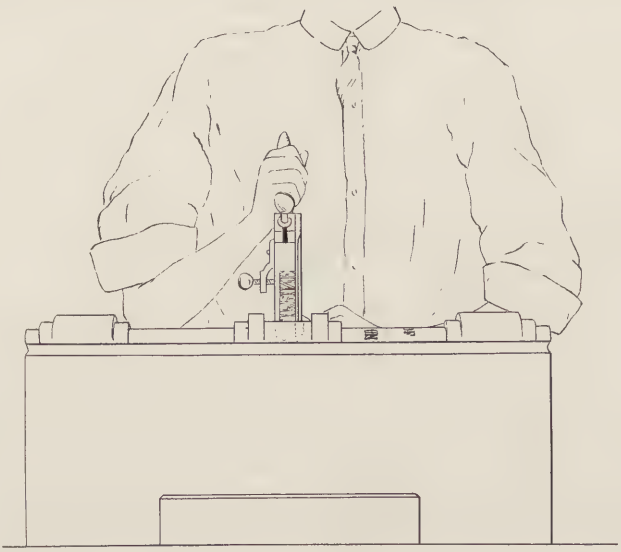
lets and rolls to be used, and place them on the stove in the order in which they are to be used.

HEATING.— The different kinds of leather require different degrees of heat. This is also true of the different colors. Dark-colored leather requires a trifle more heat



than light. Experience teaches how to obviate these minor difficulties. A saucer filled with water, containing a sponge, rag, and a camel's-hair pencil, should be placed near the stove to test the heat and cool off the rolls. When it is thought that the roll is sufficiently heated, pick it up with the left hand, and with the right apply a drop of water with the camel's-hair pencil; if the drop dries up on the roll within a few seconds, the roll is ready for use; should it hiss and be thrown off, it is too hot and must be cooled off with the sponge or rag. The majority of finishers regard the saucer and water as additional trouble, and simply apply the wet finger to the roll. If the moisture thus applied sizzles slowly, it lacks the proper degree of heat; if it leaves the roll instantly, it is too hot. The tools for morocco, seal, levant and pigskin should be lukewarm; when the moisture is applied, it produces no hissing. For cloth and imitation leathers a medium heat is required; when the moisture is applied, it is on the border of hissing. Russia, roan, sheep, lambskin, calf and cowhide require hot tools; when the moisture is applied it slightly hisses. Tooling with lukewarm tools necessitates a slow pressure; with hot tools a quick pressure is required.

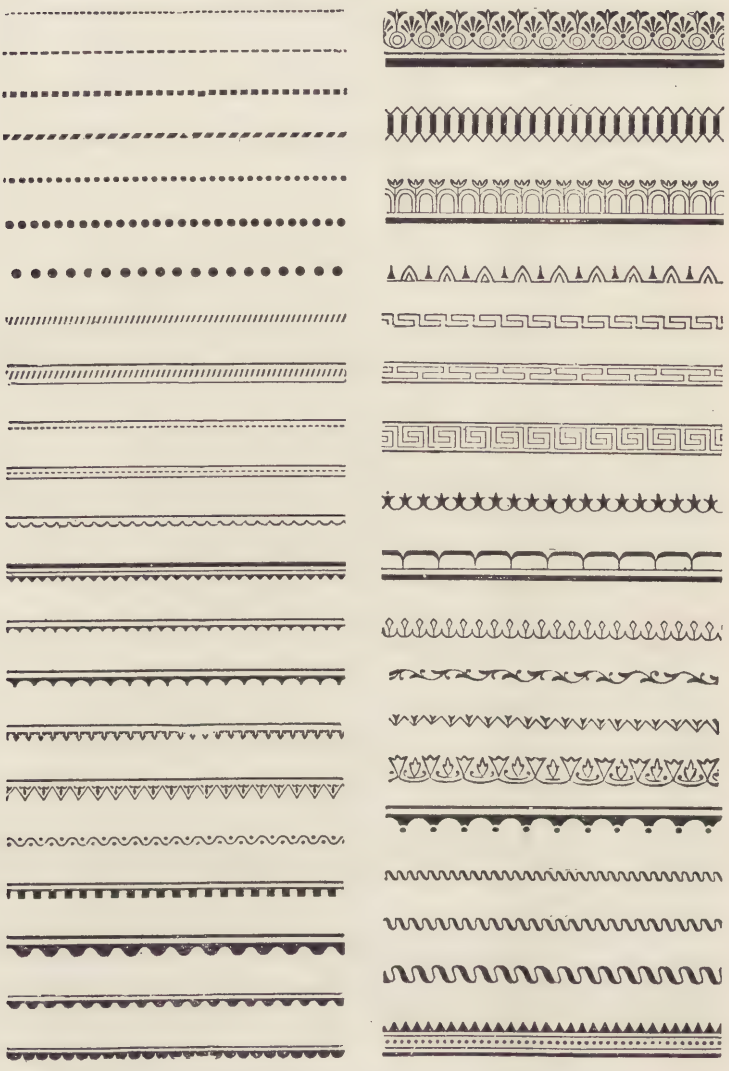
FILLETING OR ROLLING THE BACK.— The proper degree of heat having been attained, transfer the roll from the left to the right hand, and grasp it firmly near the mounting. Take the oiled rag, and rub the face of the roll to cleanse and oil it. Place the straight or left side



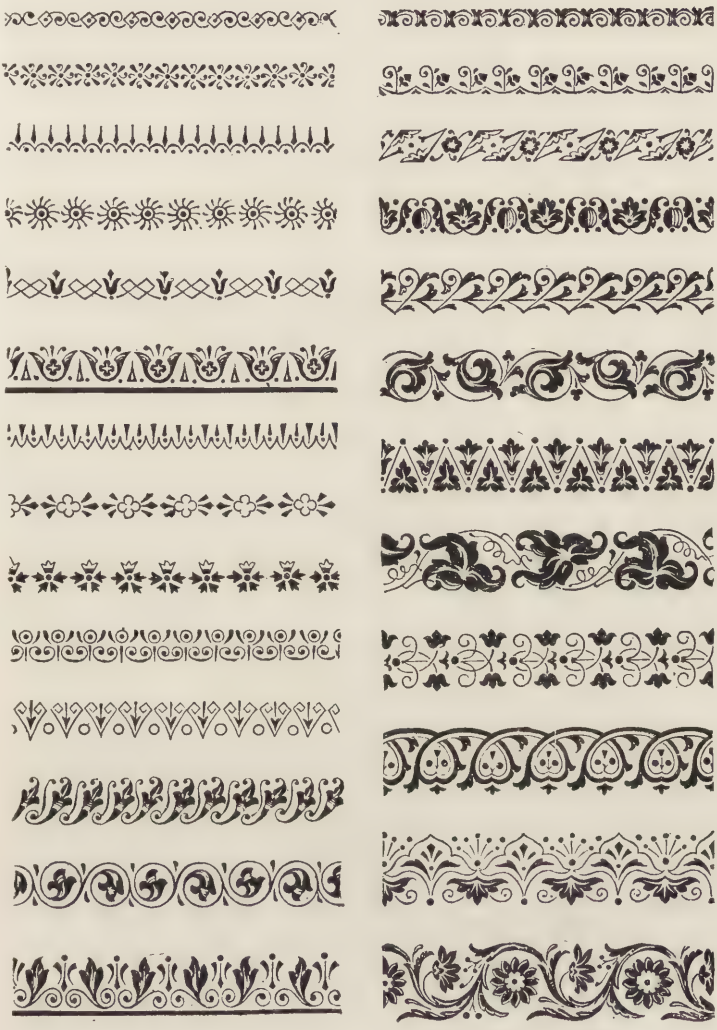
of the roll on the strip, close to the edge; this is essential, as straight rolling is largely dependent upon the accuracy with which the gold is put on the rolls. Should the gold extend beyond the edge of the roll, take a piece of cotton, and press it to the side. Place the handle on the right shoulder, with the arm from shoulder to elbow close to the body. In this position, place the roll quickly and firmly on the edge of the back, guided by the thumb-nail of the left hand, and move the body forward as the roll advances. A firm impression is required to make the gold leaf adhere.

If the books have bands or hubs, roll the end, then the right side of each band or hub. The book is then taken from the stand or press, reversed, and the operation

GILDING ROLLS.



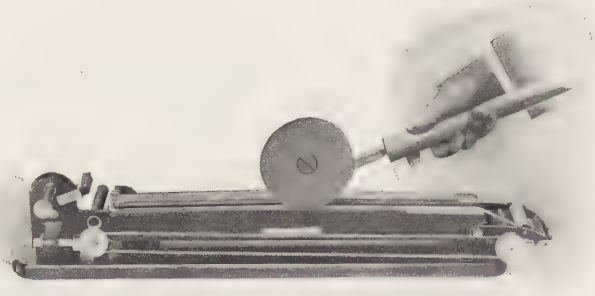
GILDING ROLLS.



repeated. The surplus gold is rubbed off with a soft flannel rag, containing a small quantity of olive or other oil. Should the lines break because of failure to give a firm, steady impression, squeeze out the camel's-hair pencil, and moisten the spot, then allow the fillet or roll to cool off somewhat, pick up a strip of gold and impress the roll in the same manner directly on top of the first impression.

FILLETING OR ROLLING THE SIDES.— This is accomplished in the same way as the back. When all the gold which a roll will hold is used up, pick up more, and bring the roll exactly on top of the line made near the end, and continue. Mitering, that is, joining the corners of fillets without running over, can be done with a roll from which a portion of the face has been removed by commencing and ending with a sharp edge of the surface.

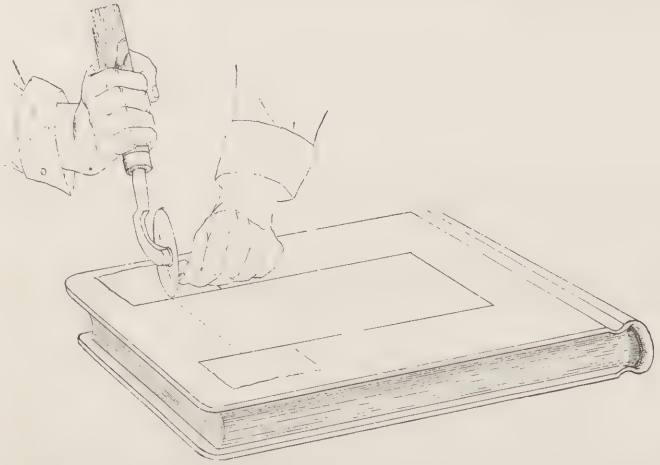
GILDING PAD FOR FILLET ROLLS.— This little machine is a gilding pad for fillet roll gilding with ribbon gold leaf. The machine consists of a leather pad with a pivot at one



end to hold the rolls of ribbon gold. The unwound gold strip passes over the pad along the side of a guide to the unwinding rolls which are operated by a belt. By pulling

this belt forward, sufficient gold leaf is unwound on the gilding pad to cover the entire circumference of the fillet roll. The gold leaf is picked up by running the heated fillet roll the length of the strip. Ribbon gold leaf is made in rolls sixty-seven feet long, one-eighth of an inch wide and upwards. The handling and cutting of gold is entirely eliminated, and a great saving is thus effected in time and material. This is without doubt a money-saver, and no bindery should dispense with its use.

FILLETING AND ROLLING WITH INK.— On canvas, drilling, moleskin, corduroy and light-colored cloth, ink is used to fillet and roll the backs or sides. For this purpose



a thick bookbinders' ink should be used. A piece of composition about 8 by 12 by 1 inches from which to take up the ink will be found useful. A roller composition such as printers use to take proofs is used to spread the ink on to the composition pad. Run the fillet or roller over the pad until the entire face of the roller is inked, then proceed to roll the back in the same manner as described in the preceding head. The side rolling is executed in the same way. When mitering is desired, lay a piece of paper on each end of the line, then roll over the edge. Repeat this

on the cross lines by laying the edge of the paper to the edge of the fillets or rolls already made. This will join the lines. The rolls should not be heated for this operation. Canvas or drilling should be dampened before rolling.

The inking operation can be facilitated by substituting a dark black ruling ink prepared with gum arabic. (See "Mixing ink.") Tie a small, soft sponge to the fork of the roll, or to a stick, and hold it so that the sponge comes in contact with the roll. Saturate it with black ink, and continue the operation as above described.

BRANDING.

Law books bound in full sheep and many light-colored leathers, such as fleshers, are often branded. This is done by heating the rolls or tools hot enough so that when an impression is made it appears brown. If too much pressure is applied, the leather will be burned. The rolls must be advanced steadily with a firm, but not too great, pressure, and must be sufficiently hot to produce a brown color. All branding tools should be tested on a scrap piece of leather before applying them to the book. The rolls should be oiled freely for this operation. Many finishers prefer beeswax to oil; this is applied in the socket by melting. Mitered connections can be made in the same way as described in "Ink filleting," except that a thin piece of board is used instead of paper at the corner connections.

As burning is injurious to leather, branding should be condemned as defeating the object for which books are covered. The execution of decorative effect should be such as will not only enhance the appearance but preserve the life of the covering material. Rolling with ink, as described in the preceding chapter, can be substituted for branding.

Fleshers can be cleaned by applying powdered pumice stone and rubbing it with a piece of scrap leather, then

removing the surplus with a stiff-bristle brush. This should be done before attempting to roll or fillet. Sheep can be cleaned with a much-diluted oxalic acid or with lemon juice.

LETTERING.

The space occupied by lettering is termed "title." Usually the name of the book is lettered in the second panel on books, in which case the name of the author should be lettered in the fourth panel; the volume number and the year in which it is published should be placed in the center panel. However, it is permissible, should fancy so direct, to place the author's name above the title. If the books have six panels, then the volume number and the year should appear in the fifth panel, and the name of the author in the second. In that case a small line should be impressed between the title and the name of the author. The purpose of five bands on letterpress books is to give an additional panel for decorating; the third and fourth nearly always have similar designs. Extra space is provided in the bottom or tail panel to place the bands slightly above the usual center, and at the same time furnish a space for the owner's imprint.

On account-books the name of the book is lettered in the second panel. In the third panel the name of the division in which the book is used, the year, the book number, or smaller subheads are lettered. In the fourth panel the name of the concern is lettered; if the concern has branch offices in other cities, the name of the city may also appear.

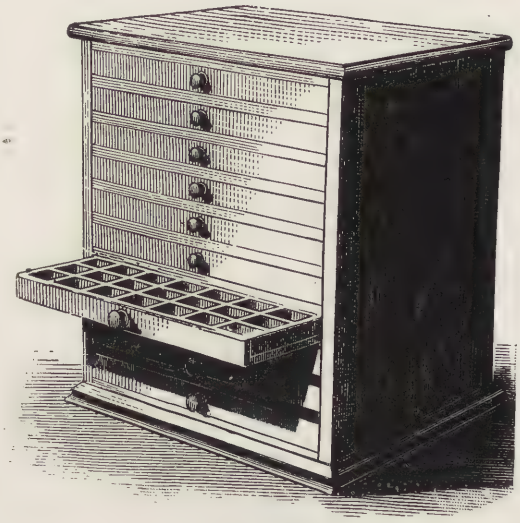
The title should be as concise as possible, and at no time should more be required than above described. Many book-lovers labor under the erroneous impression that the entire title-page should be lettered in gold on the back. It would be just as fitting to have the entire table of contents on the back in gold! Points should never be used except for abbreviations. Catch words such as "of the" need not be in a separate line of smaller type, and

wherever practicable should be placed with other words. Long and short lines should be alternated as much as possible. A word should never be broken, as it is preferable to use smaller type. When the books are thin and the

lines are long, letter the back lengthwise, beginning at the head. The natural lay of the book is on the back, and books so lettered will read regularly from left to right. When it stands on the shelf it reads downward. Many finishers letter such books from the tail up. This is obviously impracticable and should not be tolerated. When books are very thin and bound in half leather, the lettering should be on the front cover.

TYPE.—All back lettering should be in caps. with a plain, open-face type and deeply cut. The type for the second panel should be a trifle larger than the third or fourth. On blank-books the title is usually of two or three lines, and the opinion prevails that the space should be taken up with type. The judicious use of spaces in lettering is always recommended. If the type is the required height for the book, but the lines are too short for the back, place spaces between the letters. Thirty-six point, or not to exceed one-half of an inch in height, should be the maximum, and this only on large account-books. The type should be of brass, and enough should be kept on hand so that a number of titles may be set in

advance. Brass type is of irregular height and should be made to align before screwing up the jaws of the pallet; this is done by placing the line away from the bottom of the pallet, then placing a straight edge against the face of the type and pushing the letters into the back.



Type Stand.

Lead type can be used, but unless great care is taken, the face will soon be ruined, especially if there be fine hair-lines. If lead type is used, the jaws should not be screwed up tight, as the heat will expand the metal. They may be tightened after the type has attained the required heat.

BACK LETTERING.— It is well for the novice not to attempt to letter a book until he has sufficient practice, as it is difficult to produce a straight line on a convex back. A practice book can be made of binders' boards, rounded, leather tipped on both sides and finished as if it were a book. This method will enable the beginner to become accustomed to the lettering pallet and avoid spoiling bound books in finishing. All type must be set in advance,

and the number of lines to a panel determined. Pick up the line and measure it on the title to see that it comes within the width of the back. To mark the position of each line, take a strip of paper and cut it the length of the panel, impress the type to be used on the end a trifle above the edge, and divide the space from the edge of the paper to the edge of the letter. If there are to be four lines,

Lettering Pallet.

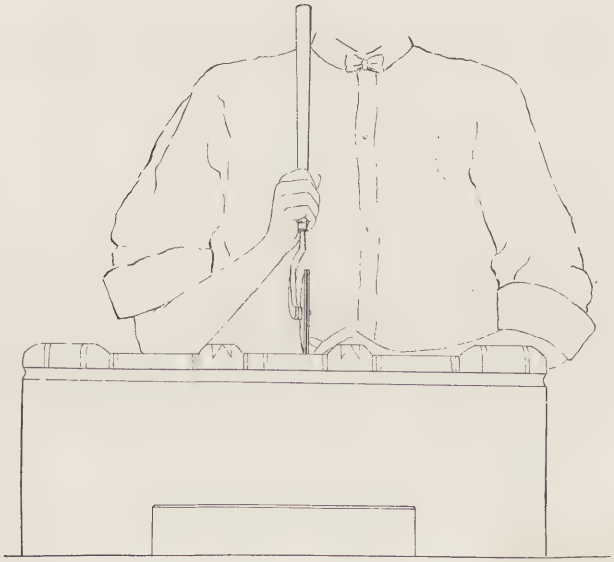
divide the space into five parts, take the dividers, space the title panel, slightly impressing the points of the dividers in the leather. This will proportionate the space between the lines and allow a trifle larger space above the first and below the last lines. Then take a thin piece of thread, wind one end on each index finger, lay it tight and straight on the division marks, and with the thumb pull the thread forward and back, thus cutting the gold and furnishing a straight line for lettering.

On all prominent grain leathers where the type is impressed before glairing or laying on the gold, chalk the thread and carefully lay it over the back from left to right.

The thread must not be pulled forward or back, as it will show the mark on the leather and crush the grain.

Then heat the lettering pallet to the degree of heat required for the material to be finished. Place the line in the lettering pallet, with the first letter to the right, and hold it in the left hand. Align the type and tighten the screws. Then clean the face of the type with an oiled flannel rag, make an impression of the type, and place the pallet on the stove. The flames should not come in contact with the type, as the heat is apt to be irregular. A piece of copper or sheet iron should be placed on the stove and the lettering pallet laid on top. Lay the strip of paper on which the type has been impressed on the title panel close to the edge of the gold to center the type; provide the same space on both sides from the edge of the back, and mark the starting point of the type.

Pick up the pallet, and test the heat. This has been fully described under "Filleting and rolling," covering the different leathers. Then place the arm from elbow to



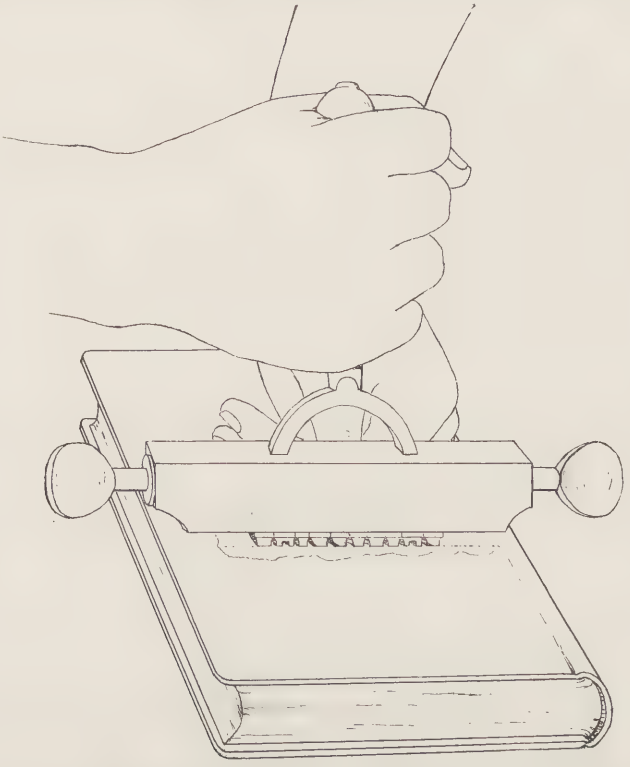
shoulder close to the body, bending forward; then gauging the line with the thumb-nail of the left hand, firmly impress the type at the starting point, and gradually across the back. The forward movement of the pallet is made with the wrist, bending the body with its movement; on large type a side to side motion will strengthen the impression and insure the holding of the gold. If the type is too hot, the gold impression will be dull; if too cold, the gold will not adhere. If the type is held too long, the heat will destroy the adherent properties of the gold.

Take a piece of flannel, containing a little oil, and rub off the surplus gold. If, for any reason, the gold does not adhere, take the camel's-hair pencil, squeeze out size, and moisten the spot, then allow the pallet to cool; oil the face of the type with the flannel rag, pick up two pieces of gold leaf on the letters which require patching, and impress the type a second time. Care must be taken to make the same impression or the letters will be doubled.

This operation is repeated with the second and subsequent lines. When all the lettering has been executed, the remaining gold spots can be removed with a rubber, and finally a very little gasoline will cleanse the titles from all specks of gold leaf, as well as streaks of glair. On prominently grained leathers the title panels may be polished, thus enhancing the appearance.

SIDE LETTERING.— To letter the sides of leather-bound books, prepare and lay on the gold as described under the respective heads. Mark off in the same manner as above described, except that a piece of paper is laid on the gold at the mark, and the gold leaf rubbed off. Place the book with the tail toward the body, and grasp the pallet, which has been prepared and heated as above described, in a horizontal position with the opening toward the body. The hand is held so that the arm from the elbow to shoulder is close to the body. This steadies the hand, as well as enables the finisher to gauge his line. In this position

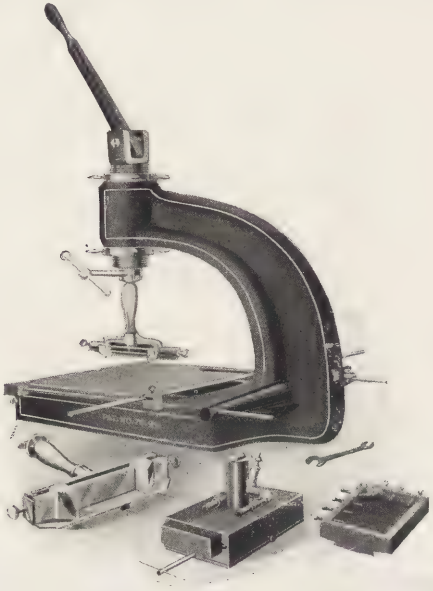
the type is set down on the left end, even with the edge of the gold, gradually resting the entire line of type even with the edge of the gold leaf. Steady the pallet with the left hand, and, with a slight rocking motion forward and backward, make a firm impression. When once the type



is on the gold leaf, slipping or adjusting the direction of the line will rub off the gold, and it must then be patched. In patching, two pieces of gold leaf should be laid on the leather or type; this will permit of a slight adjustment in the impression without rubbing off all the gold leaf.

The second and subsequent lines are performed in the same manner. When the lettering is completed, rub off the surplus gold, and clean with gasoline.

LETTERING CLOTH OR BUCKRAM.— This material is best lettered with powder on individual books, and if executed a short time after the cases have been made or the books sided, a firmer impression with the type can be made. Whenever the cloth is allowed to get hard, it should be moistened with water and lettering should be commenced in about thirty minutes. Should, for any reason, the dampening of the cloth be impracticable, then make a blind impression before attempting to letter. Take a piece of absorbent cotton or a soft-hair brush, and dust on the gilding powder. Mark off the position of the lines as above described, lay a strip of paper on the mark, and rub off the dust with a rag. The rag used to cleanse



Gane's Patent Pallet Embossing Press.

the type and rolls preparatory to affixing the gold leaf should not be used for this purpose, because when used again the gold will stick to the rolls or type instead of the material. Mark the position of the line on the side, pick

up two or three layers of gold, and impress from left to right on the edge of the powder as above described. Rub off the gold leaf and powder, and proceed with the remaining lines in the same manner. When patching is necessary, dust on more powder and repeat the operation. The type for all lettering with powder must be lukewarm, or the results will be unsightly. For side lettering the panel stamping press makes the work easy and accurate.

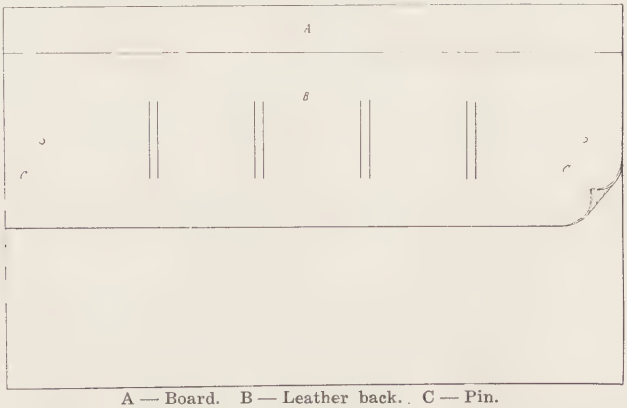
NOVELTY LETTERING.— The average finisher is frequently called upon to letter novelty work, such as boxes, music holders, grips, cigar and cigarette cases, etc. The first care should be to build up a solid foundation to letter on, then proceed as directed for cloth with powder.

If the material has been varnished, the type should not be as hot as for ordinary lettering with powder. Some finishers endeavor to remove the varnish by washing with alcohol, but this can not be recommended, as it soils and stains the leather.

LETTERING IN INK.— Canvas, moleskin and similar fabrics are lettered in ink. Set the type and measure the panel space as described in a preceding head. Cut a piece of thread eight inches longer than the width of the book, and tie a brass or lead slug on both ends. Lay the thread straight across the back on the mark previously made for the first line; the two slugs hanging will hold the thread in position. This is the guide for the line. Take an impression of the type on a strip of paper, and mark the position of the line on the back. Prepare the ink as described under " Filleting in ink," place the face of the type on the ink pad once or twice, then impress the type on the title panel close to the thread. Too much ink on the type will spoil the lettering. Repeat this with all subsequent lines, then lay aside. The ink will take better if the canvas is moistened with a sponge of clean water, and a little time is allowed to elapse before lettering.

Light cloth or buckram should be executed in the same manner. On large orders of canvas-bound books, a substitute which is more expeditious is to stamp a cloth or leather title in foil or aluminum leaf, and paste it on the panel.

Short Cuts to Eliminate Hand Lettering.— Hand lettering is at best a slow and expensive operation and can be frequently dispensed with on five or more books having the same lettering. This applies to nearly all styles of binding. It is much quicker to letter the backs on a stamping machine with the type locked in the chase than to do the operation by hand. Backs so treated require greater care in forwarding, as the water must not penetrate the leather. In the case of loose-back books, both account and letterpress, paste a piece of paper the exact size of the back on the leather. Letterpress backs

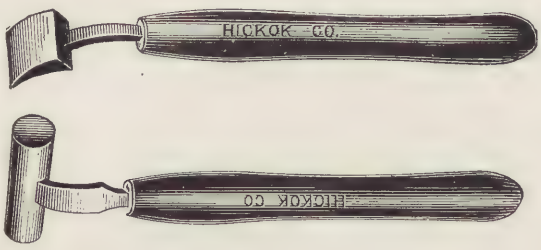


A — Board. B — Leather back. C — Pin.

with bands can be made as described in that head under "Forwarding." Full leather can be done in the same way if the forwarder uses discretion in the height of the hubs. On five or more books, full drilling, canvas, or moleskin, it is quicker to stamp titles on cloth or title leather (skiver) and paste on the book than to letter by hand. The side title should never be on a separate piece of material, as its tendency is to peel up in handling.

POLISHING.

All smooth-grain leathers can be polished to brighten and enhance the appearance of the leather. This must always be done after the gilding has been executed. Glue



a piece of calf or sheep on a piece of board to clean the polisher. Mix powdered charcoal with vaseline, and rub on the surface of the leather. Rub the polisher over this freely to release all foreign substance which may adhere to it, and thus avoid scratching the leather. Take the gold rag and remove all dust and dirt from the back of the book. Then heat the polisher so that it hisses or is a trifle hotter than rolls are used; if it is too hot when applied to the leather, it will darken the leather and turn the glair white; if too cold, the polish will be dull. A practical finisher can gauge the heat of the polisher by holding it a little distance from his face, as the heat radiates from the iron. Take the polisher in the right hand near the mounting, with the handle resting on the shoulder. Then rub the back evenly, beginning at the head, working from right to left and back again, until the entire surface has been gone over. Then take the book out of the stand, lay it on a clean pressboard, and repeat the operation as described. Begin on the left, starting at the bottom and gliding to the head and back again, advancing gradually to the right, until the entire surface has been polished. This should be done quickly and firmly. Turn the book around, and repeat the opera-

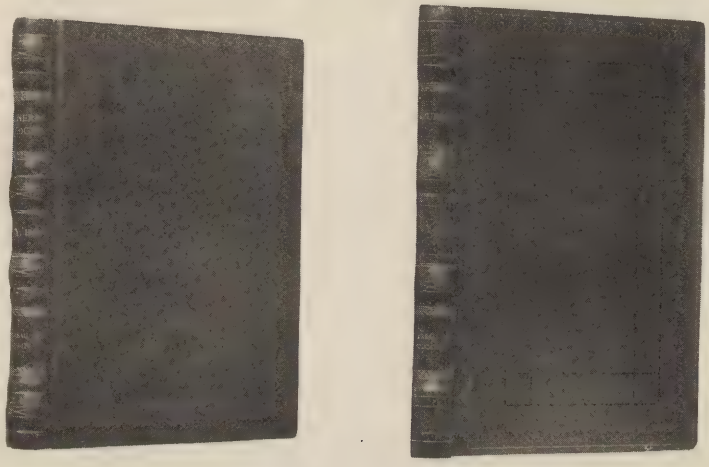
tion from the fore edge to the back, and then back again from left to right, until the surface has been gone over a second time. If properly executed, the burr left by the impression of the rolls or tools is pressed down, and the impression is brought up slightly to the surface. The polisher must at all times rest evenly on the surface, as a little side twist will indent the leather. As the trend of the times is toward the preservation of the grain of the leather, polishing is losing favor. It is questionable whether this method of embellishing tends toward the preservation of the leather. It would seem that the friction produced by a hot tool would kill the volatile oil which remains in the leather.

VARNISHING.

The utility of varnish is debatable. It is argued that the surface of leather needs a gloss-giving property to preserve the brilliancy of the gold. If the gilding has been carefully executed and the gold leaf appears bright, the leather has been polished and a filler used in the preparation, this ought to suffice. Some use it to brighten the leather, others to assure the holding of the gold leaf, still others to keep vermin out of the pores of the leather. Leather should be livened up every six months or a year with vaseline, to replenish the volatile oil, which evaporates, especially in hot rooms. To preserve the natural grain of the leather is considered good taste in finishing; and polishing, like the varnishing of books, is less favored than in former years. If a varnish is used, it should be such as will not soften in hot weather when once applied, and should never be used on prominent-grain leathers, such as morocco. French varnish has found favor for this purpose; this must always be reduced with alcohol before it can be evenly applied. If the varnish is used too thick, it will turn brown. In cold weather, warm the varnish before applying. There are numerous other varnishes in the market claiming special drying qualities.

A varnish can be made by dissolving one-half pound of shellac in one quart of alcohol. Another consists of three pints of forty per cent alcohol, one-half pound of sandarac, two ounces of mastic, and one-half pound of shellac. This should be dissolved by placing the vessel in boiling water, after which two ounces of turpentine are added, and the mixture is allowed to cool. This should be kept in a corked bottle. A white varnish is made of one-half ounce of copal, one ounce of camphor, one quart of ninety-five per cent alcohol. Dissolve this as above described, then add two ounces of mastic and one ounce of turpentine; strain, and keep in a corked bottle.

Take a piece of absorbent cotton, and make it into a small ball, then tie a piece of cambric around; saturate



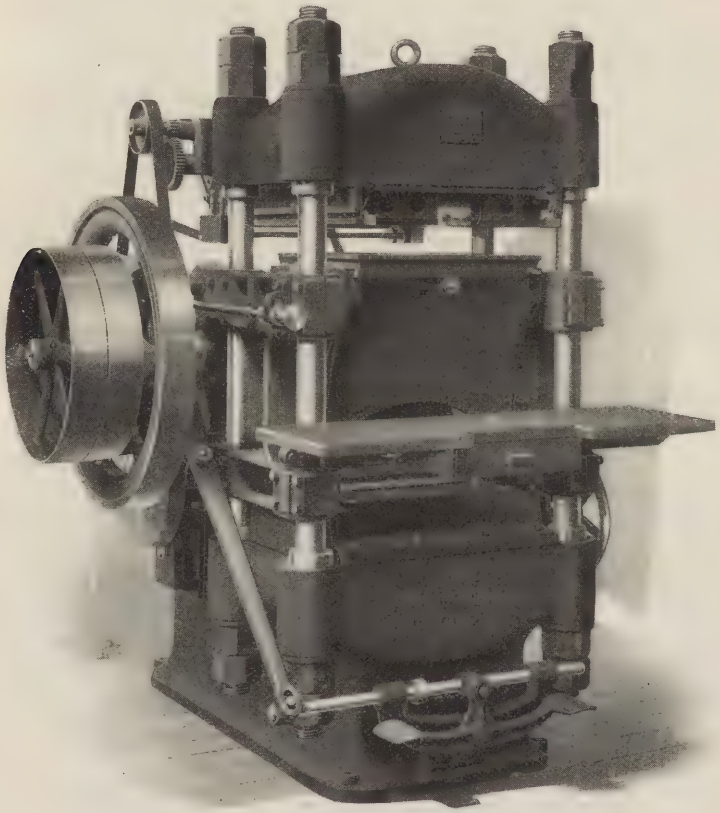
it with varnish, and rub it on a piece of paper. The ball should be thoroughly moistened, and should not contain too much varnish, as it will be difficult to avoid streaks. Begin at the head and apply the ball to the surface of the back, from right to left, gradually working to the tail. If the ball is once on the surface, complete the stroke and avoid going over the same place a second time, as it will

be too tacky, and an even distribution is impossible. For the sides, repeat the operation, except that the entire length of the book must be covered with one stroke, and advance gradually until the fore edge is reached. Set the book to dry by throwing back one board and laying it on the bench. Dust should be kept away from varnished books, as it will adhere to the varnish and render the books unsightly.

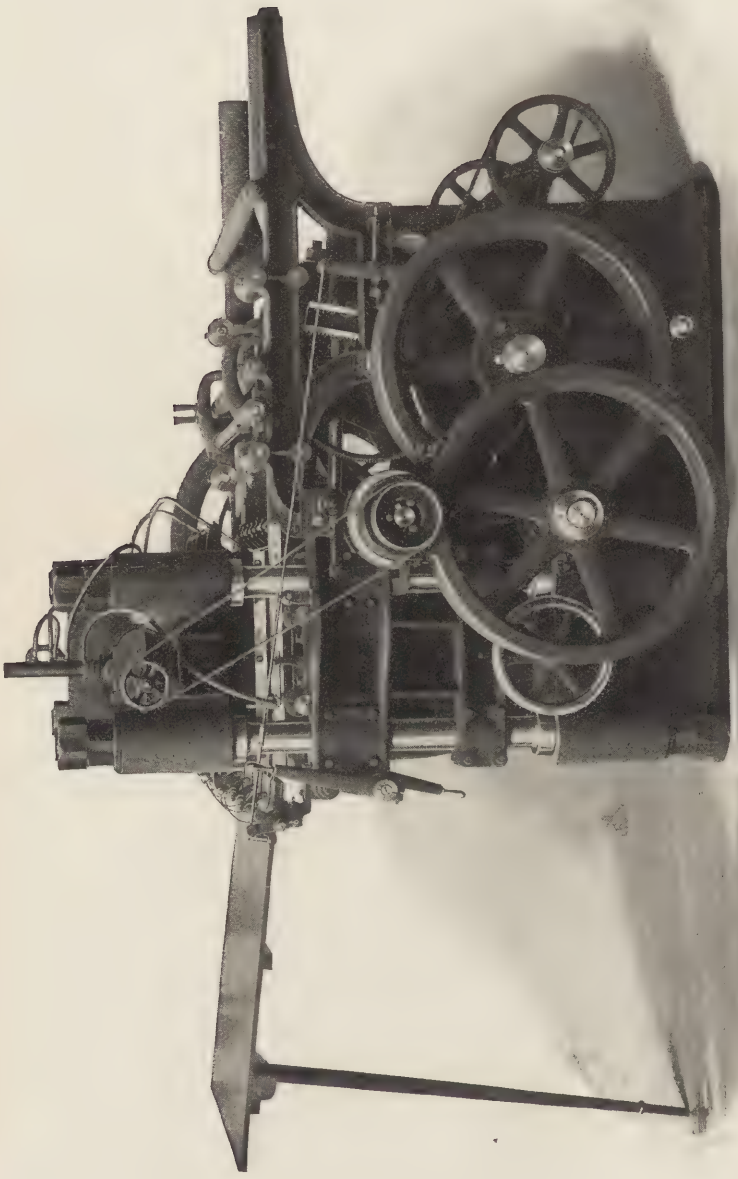
STAMPING AND EMBOSSING.

STAMPING.

Stamping is understood to mean the impressing of type, dies, plates, either brass or electros, into binding material, with ink, foil, metal or gold leaf. Blind stamping is impressing without intervening material. Dies or plates can be carved out for embossing. The stamping



Seybold Inking and Stamping Press.



Seybold Automatic Feed Embossing Machine. (From 840 to 1,200 per hour.)

operation may be termed "Machine Finishing," as it is an elaboration of lettering or tooling.

In decorating book covers, knowledge of such materials as leatherette, leather, cloth, silk, satin, celluloid, enameled paper, cardboard and wood must be possessed by the finisher. Simplicity in this, as in finishing, is far more attractive than the ornamentation of the entire cover with different colors of foil or ink. The design must not

Bench Stamper.

be so dense as to obliterate the cloth or leather grain. Failure in this stamps the product as inferior.

The machines for these operations are numerous and in the main designed for embellishing covers for books. Hot or cold embossing can be executed as well as printing

on paper or covers. The machines are powerful, and the adjustment is simple. Each of them is equipped with a chase in which type may be set and locked in the same way as for the printing-press.

The heating can be done with steam, gas, acetylene, benzine or electricity. The last is preferable on account of cleanliness and less danger to health.

DIES, PLATES, TYPE, BORDERS, ORNAMENTS.— The most common dies used for this purpose are made of electrotype about three-eighths of an inch high; brass dies or plates should be made type high, which can be fastened between the jaws in the same way as the machine block. Electrotype plates should be made with an extra heavy copper shell, which will withstand the wear better than the ordinary electrotype plate. On large orders a number of plates should be made, as the face of the plate is not hard enough to withstand the constant pressure. One plate will last for about five hundred cloth covers, unless there are hair-lines, then more plates are required. It is preferable to engrave brass dies or plates on large orders. For lettering, brass type should only be used and a sufficient supply kept on hand to set several lines. Sorts of various widths, brass rules, border and type ornaments are required to stamp the regular run of work. With an outfit of this character, artistic work may be executed in a superior manner. Equipment can be had, consisting of brass type, rules, borders and ornaments, one-fourth or three-eighths of an inch high.

MAKING READY.— All dies or plates made type high should be locked between the jaws of the machine. The dies or electrotype plates which are to be attached to the machine platen should be washed on the back with muriatic acid to remove the grease; the face should be polished with charcoal and washed with benzine, then oiled thoroughly. Take a piece of cover paper or cardboard not to exceed one-thirty-second of an inch in thickness and paste it to the machine platen with fish glue, gum arabic

or paste. Then place the block in the machine, and tighten with the key wrench. Scratch the back of the die or plate, glue a piece of paper on the back of it, and rub down; trim the paper even with the die or plate, apply a coat of paste or fish glue, lay it in the required position on a piece of board, cut the size of the material to be stamped; place it in the machine in the center, and bring up the bed of the machine gradually. In this position allow it to remain for five or ten minutes, with the heat turned on. If the plate or die is not placed in the center, and the material to be stamped requires a firm pressure, there is danger of straining or breaking the machine.

Set the gauges at the head and side and tighten the bolt. These gauges can be adjusted, should the die slip while stamping.

If, for any reason, it is impracticable to use these gauges, take type sorts about one-fourth of an inch high, and glue them to the bed or on the overlay of the bed. It is, obviously, impracticable to stamp thin material without placing a layer of board on the bed of the press, as it would readily ruin the plate, die or type. A piece of thin binders' board, such as No. 40 or No. 30, should be attached to the bed. On cases, unless the board is too thin, this is unnecessary. Then place a sheet of the material to be stamped against the guides and make an impression.

The bed of the machine should be adjusted so that the material on the bed barely touches the plate, die or type, and gradually increased until the desired impression is reached. To endeavor to obtain the correct impression at the start is likely to result in smashing the die, plate or type, or in straining the machine. If the impression is uneven, paste a piece of paper on the underlay of the bed where it is weak.

A design for the cover may be made of several pieces; four pieces of lines for the outer border, four pieces with a floral or other pattern; four corner pieces to match a

lettering piece, and a crest or monogram for the center. The type, borders or ornaments, which are from one-fourth to three-eighths of an inch high, are mounted together to fit the desired space. The design is drawn on a piece of binders' board; the board is glued with fish glue; and the type, border and ornaments are placed in their respective positions. To prevent any portion of the design working loose, pour a little hot glue around the base of the engravings, especially where small type appears. When dry, place the cover on the design and a small wooden board on top. Draw the whole carefully off the bench onto another board, and turn it over quickly; place it on the bench with the face resting on a cover and a wooden board. Remove the top board, apply a coat of glue, place it in the machine and bring up the bed so that it comes in contact with the machine platen. This method is superior because it saves the cutting of brass dies or the expense of making electrotype plates.

The sides and back of covers may be stamped in one operation by gluing a strip of board the thickness of the cover boards and the length and width of the back to the bed of the machine.

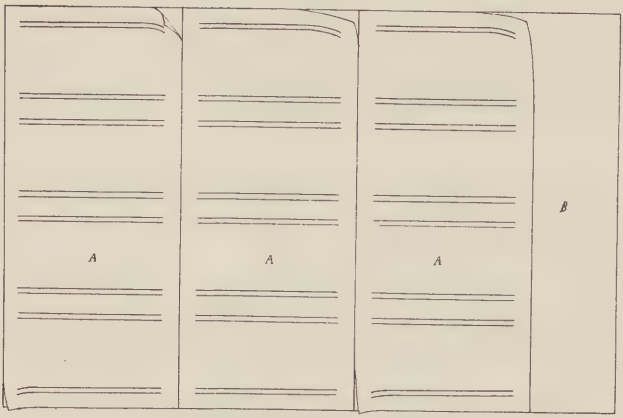
To assure the rigid holding of the die or plate to the machine platen, holes may be drilled into the platen and the dies or plates screwed to the platen before placing it in the machine. This will not impair the platen and prevents dies or plates from sliding, which is valuable where two or more impressions are required on long runs.

HEATING.— No fixed rule can be laid down to accurately gauge the heat in stamping. The test suggested for tools will suffice for this purpose, except that the pressure and the length of time the die or plate remains on the material must be considered.

Calf — hot for dark leathers; less for light colors.
Cloth — medium heat.
Cowhide — hot heat.
Goatskin — medium heat.

Morocco — medium heat.
Pigskin — medium heat.
Sheepskin, roan, bock, etc.— slight heat.
Silk, gilding powder — short, hot pressure.
Surface papers, cardboard, etc.— short, medium pressure.
Varnished papers — slight heat.

STAMPING TITLES.— To facilitate lettering, law books have two or three colors of leather for the title pasted on the back panels. Red is placed in the second panel, green



A — Title leather. B — Board.

in the third, and blue or black in the fourth. These titles can be stamped in one operation by having the plates made side to side. To prepare the material for stamping, cut the title leather four times the length of the panel, plus one inch for cutting apart and one-half of an inch larger than the width of the panel space. Then cut a piece of straw, pulp or binders' board three times the width of the leather; run out one end of the board and leather, apply a coat of medium-thick paste to both, then lay the dry edge of the leather on the pasted edge of the board. Repeat this on all subsequent strips, and lay on top of each other. For the second or green title strip,

run out one end of the leather, apply a coat of paste to a piece of zinc or wooden board, take a piece of No. 30 binders' board, and lay the edge on the paste, then transfer it to the pulpboard close to the edge of the red title leather. Pick up one strip of the green title leather, and lay it with the dry edge close to the edge of the red title leather. For the third or black title strip, repeat the operation as for the red or first title strip. Then take the board to the cutting machine, and square the edges. When dry apply a coat of glair and lay on the gold as described under those heads. Then set the die or plate into the machine, and adjust the gauges to the right, left and front. If there is but one set of plates, feed the board with the leather on top to the right, then to the left, and set a brass rule along the front, the edges of which should serve as a guide for the center spaces. Or, glue a strip of No. 40 board one-half of an inch square on the bed for the two center title guides. In that event, feed the board for the left end title space to the right, then the second and third to a board gauge to the left, finally the right end title space to the left gauge.

The titles (labels) may be taken to the cutting machine and cut apart the exact size of the book panel.

BLIND OR BLANK STAMPING.— Designs are frequently stamped in blank and the lettering in gold leaf. This makes a pleasing combination, and is permissible on both letterpress and account books. A heavy blank rule between two fine gold lines on letterpress books makes a good border combination. The blank stamping should always be executed first; afterward the stamping in ink, gold leaf or metal. To do this, prepare the stamping machine, dies or plates as described under "Making Ready." Then take the covers after they have been made for an hour or more, and proceed to stamp with a slight heat. This first impression should always be done while moisture remains in the cover. If the material is too dry, sponge it with clean water. The second impression should

be made when the covers are thoroughly dry with a short, hot pressure. This will produce a bright blind impression. If gold leaf is to be stamped in connection with the blank, prepare the covers as described under " Preparing Leather " and " Glairing." On certain classes of stamping, one impression can be eliminated by stamping when the material is fairly dry with a medium-hot die or plate. Morocco, calf and delicate colors of leather should be blind or blank stamped, and the glair penciled in.

STAMPING WITH FOIL.— On dark cloth it is difficult to obtain satisfactory results with ink; hence, foil finds favor in stamping dark cloth cases. This material is obtainable in any color, including bronze. To prepare the cases for stamping with foil, apply a thin coat of glair or size, as described under that head. If a little moisture remains in the covers, the application of glair is unnecessary. Take the foil to the cutting machine, and cut it approximately one-half of an inch larger than the die. Cut a piece of board for a pattern, and mark the position of the die thereon. (See " Laying on Gold Leaf.") The machine must be heated as for gold leaf, and the material placed in the machine and given a quick, firm impression. When this operation has been completed, take a short, stubby brush and remove the surplus leaf. The smaller remaining particles can be removed with a flannel rag.

STAMPING WITH INK.— To print covers made of either paper, cloth, drilling, canvas, silk or satin, the operation conforms to that of the printing-press, and the material requires no previous preparation. If the machine has been previously used for stamping with gold, metal or foil, it must be cooled off before attempting to stamp with ink. If the machine is heated with steam, cold water can be run through the head, thus hastening the cooling. However, in most establishments the laying out of the work will take this into account, and the machine will be kept busy without inconvenience. The preparation of

the dies, plates or type is described under "Making Ready." Inks for this purpose are prepared stiff, and dry quickly. These can be purchased from supply houses as "bookbinders' ink." Almost any shade of color can be purchased, but should the amount of such work in any establishment not justify the outlay of money, they may be mixed. It is well to remember that the lighter colors are more readily changed by the addition of a small amount of dark colors, than to change the darker colors by adding light colors. It can be done either way, but it requires more light color to change the dark than the dark to change the light color. Mix the inks with as few colors as possible, because every added color tends to change the shade toward gray or black. The ink should be prepared on a piece of glass, and grease or dirt should be guarded against. The addition of varnish, oil, dryer should be avoided, as the ink comes prepared. Should it be necessary to brighten colors, add dammar varnish to light colors and amber varnish to the dark. Turpentine will enhance the brilliancy of the color, but retards drying.

The following combinations and the order in which they may be mixed will assist in producing the desired shades:

Red, amber, black = claret.
Red, black, yellow = chestnut.
White, yellow, red, black = gray.
Yellow, blue, black, white = olive.
Violet, red, white = purple.
Yellow, red = tan.
Red, blue, white = violet.

If covers are to be stamped with gold, metal foil and ink, complete the metal operation, and then the last impression is made with ink. A blank impression must be made before inking the design, and frequently two impressions are required to produce an even distribution of ink on the covering material. All colors of ink except

white can be utilized for this purpose. For white, foil must be substituted. A quantity of ink will not improve the appearance or eliminate a second impression; too much ink will squeeze out around the edges of the die, plate or type and the finer detail will be lost.

INK ROLLERS.— The ink rollers are made of composition, and are similar to those used on the printing-presses. If they become worn, remove the composition with a knife and prepare a quantity of composition by melting. This can be purchased in a prepared state from supply houses. If hard rollers are desired add glue. With every machine is supplied a perfectly smooth iron mold, which contains a hole in the bottom large enough to admit the roller stock. The top lid is a cross-piece with a hole in the center to fit the stock. Saturate a rag waste or cotton with cocoanut oil and oil the mold. Place the roller stock in the mold and pour the composition into it. Allow it to stand for twelve hours, then pull the roller out and trim the rough composition.

COLOR PRINTING.— This can only be done satisfactorily on a smooth surface. If two or more colors are required, print red, brown or yellow, or color containing large proportions of those colors, first. Make proof impressions in advance, and note the proportions of colors. The outline if printed in colors is executed last and gold first. Bronze for covers should never be used, as gold or aluminum leaf can be satisfactorily substituted. This can be stamped on colors with gilding powder, if the ink has thoroughly dried.

EMBOSSING.

Embossing, or relief printing, can be done on stamping machines having inking attachments, in much the same way as for ordinary stamping, except that the raised portions are let into the brass plate or die to the required depth. To obtain good results, a uniform engraved plate or die must be obtained, and the matrix

built up properly on the bed of the machine. This is best accomplished with heat. The making ready of the die is fully explained under "Making Ready." Take several thicknesses of card or pulp board and glue them to the bed of the machine, allow to set for a short time, then take a weak impression and increase this with each subsequent impression until by a firm pressure the relief in the die or plate is filled up. Then take a piece of cardboard, place it in the machine, and give it a firm pressure. Cut away, preserving only the portions which correspond to the relief in the die or plate. Glue these exactly on the outline already obtained on the cardboard which is the foundation. Where the engraving is extra deep, cut out another piece of cardboard and glue on to the foundation; this is repeated until the engraving or relief in the die or plate is filled up. Finally glue (shoemakers' wax may be substituted) a tough piece of ledger paper over the entire surface, give the whole a quick, firm pressure, then heat the machine.

For two or three color work, where very sharp outlines are required, a more satisfactory method is to make the matrix as above described, by building up a few pieces of cardboard on the bed, and taking a firm impression. Mix dextrine and whitening in cold water until the mixture is a thick paste, or use shoemakers' wax; spread this all over the impression made on the cardboard, and lay a piece of tissue paper on top. Take a firm impression, and the outline of the matrix will appear in the negative. If this does not fill up the engraving or relief in the plate or die, apply a thick coat of the above-mentioned preparation, and lay another sheet of tissue paper on top. Take another impression and allow the machine to remain in this position to enable the form to set properly. Such matrices should be prepared near the close of the work day to permit them to set and harden over night.

For this same purpose talking-machine records give satisfactory results. Oil the plate or die, then glue a piece of heavy cardboard to the bed of the machine, apply a coat of glue, and soften an old talking-machine record by heating; when soft, lay it on the glued cardboard, with a thin piece of tissue paper on top, and make a firm impression with the die or plate. When the composition has hardened, chip off the surplus. This matrix requires no patching, and will last for the longest runs.

Another adhesive compound is made by mixing plaster of Paris in alum water to which glycerine has been added. The alum possesses hardening properties, while the glycerine keeps it moist to enable completion of the matrix before setting. The matrix of each job should be preserved for future occasions, as reprints of editions are frequent, and a saving of time is thus effected.

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